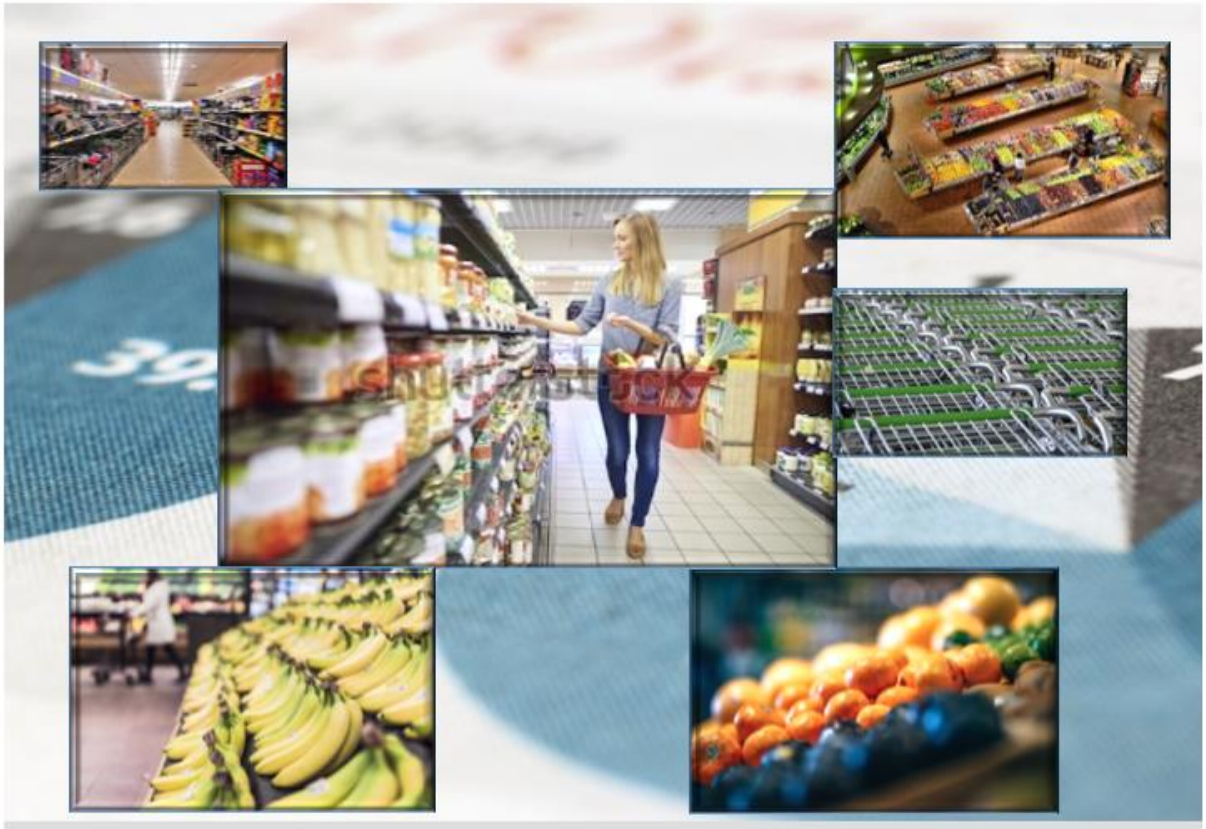

Supermarket Moratorium for Small Island Economies

Is Moratorium Justified – The Case of Aruba

Department of Economic Affairs, Commerce and Industry (DEACI)

1/9/19

Research and Policy Department

Supermarket Moratorium for Small Island Economies

Is a Moratorium Justified-The Case of Aruba

Research project prepared by the Department of Economic Affairs, Commerce and Industry (DEACI)
Research and Policy Department

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EXECUTIVE SUMMARY

This paper is part of a continuous effort aimed to address the retail industry's rapid growth and the assessment thereof. More specifically, this research focused on the supermarket sector and the externalities caused by the rapid growth of sector on the island. The purpose of this study is to analyze and determine the nature of the supermarket development and its impact on the spatial congestion, sentiment of the population, and the market structure of the island. The analyses was conducted using a series of indicators, both qualitative and quantitative. The proposed indicators and results are used as justification mechanism to continue or not continue with the existing moratorium. We suggest that policymakers and government officials use the proposed methodologies and results as a foundation to justify the existing moratorium and/or future moratorium within a specific economic sector. All this while considering the unique challenges small island economies face with promoting economic growth while balancing the social and environmental impacts thereof.

The research suggested a four (4) Phase methodology consisting of the analyses of both qualitative and quantitative analysis. Indicators related to sentiment analyses, spatial analysis, and market growth analyses were used. There is a strong perception amongst consumers and citizens that the island has reached a level of spatial congestion and market saturation within the supermarket sector, as most of them were built in close proximity and at a rapid rate. Consumers also perceive this as a conflicting phenomenon with the island's current rural development program. This also affects the island's efforts in implementing sustained urbanization while preventing market saturation and cannibalization within the supermarket sector.

Further work is called for to discuss the proposed methodologies and obtained results with policy makers and other related stakeholders on the island; and subsequently reach a consensus on a national framework consisting of strict guidelines for a sustained development of the supermarket sector of the island.

INTRODUCTION

The wholesale and retail industry accounts for one of the largest branches of Aruba's economy, with a relative growth of 13.2% from 2003-2013 and with the second highest percentage of number of employees within the economic sector. The hotel and restaurant industry accounts for 24.7 % of the total workforce, where the wholesale and retail industry accounts for a total of 20.9% [1].

Despite these promising numbers, there has been an unprecedented feeling of growth in the wholesale and retail industry, particular within the supermarket sector. There is a perception that the growth in the number of supermarkets has reached a level of congestion and market saturation and there are concerns of a misbalance between supermarkets expansions and the scale of social and environmental impact it has on the corresponding neighborhoods.

Unfortunately, measuring the congestion and market saturation level within this supermarket sector remains a challenge, as there are limited amount of methodologies or specific data that indicates the clear relationship between the increase of supermarket development with other economic, social and environmental indicators. Indicators such as total revenues, increasing consumer mobility, increasing electronic commerce, changing household size and characteristics, and concentration of market power has been proposed and tested in previous academic articles, but is lacking for specific challenges that small island economies face. Definitional challenges in terms of supermarket classifications are also lacking, and jeopardizes the process in establishing a clear-cut economic -, social -, environmental indicator to validate the saturation level within this sector. This has been a repeated expression related to this concern in both trade and academic journal articles suggesting specific definitions in terms of size and scale, products offered, store format and trends within this sector.

Have we reached a point of market saturation, or is it a "sooner, rather than later" phenomenon that the entire domestic market will attain a state of absolute saturation. Are previous calculations sufficient or valid enough to provide policy makers with the necessary support for the extension of the existing moratorium? To answer these questions it is necessary to propose additional economic, social and environmental indicators to further validate a market saturation level of supermarkets within the supermarket sector. The intuitive link between capital investments in the retail industry and its impact on retail saturation, perhaps also relates to the dramatic store expansions policies supported by the free-market enterprise promoted by local governments[2] .

As it relates to the local scenario, The Department of Economic Affairs, Commerce and Industry (DEACI) had proactively produced two reports related on this matter. They are "Moratorium Studie Aruba 2007"[2] and "Verzadiging Supermarkten Ja of Niet" [3]where the latter has been used by previous Ministers to establish the current moratorium, which was introduced in May 23rd of 2017, and is still in effect.

Rapid expansion of supermarkets on a small island remains an issue, as there is a misbalance between the negative perceptions of local citizens towards supermarket development and the necessary rural development that is needed within a small economy.

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[1] Central Bureau of Statistics (CBS), 2013. Statistical Yearbook.

[2] Department of Economic Affairs, Commerce and Industry (DEACI), 2007. Moratorium Studie Aruba 2007. Afdeling Vestiging van Bedrijven.

[3] Department of Economic Affairs, Commerce and Industry (DEACI), 2016. Verzadiging Supermarkten Ja of Niet. Afdeling Economisch Beleid en Onderzoek (EBO).

The above-mentioned concerns demand unique attention from policy makers, urban planners and government officials, but it cannot be addressed without having a series of validated indicators to support sustained -, inclusive - and sustainable economic growth, full and productive employment and decent work for all (SDG 8). Therefore, it was suggested to use the proposed indicators and results as justification mechanism to continue or not continue with the existing moratorium.

The purpose of this study is to analyze and determine the nature of the supermarket development and its impact on the spatial congestion, sentiment of the population, and the market structure (Herfindahl-Hirschman Index, Consumer Price Index and Growth in Industry) of the island. The analyses was conducted using a series of indicators, both qualitative and quantitative, as an analytical tool for policy makers to address such concerns.

Several questions were proposed to address these concerns. They are: a) Do citizens wish to see more supermarkets built on Aruba?; b) What factors influence the sustainable development of supermarkets?; c) Is a moratorium on supermarket expansion justified for all areas on the island?; d) What is the market structure of the supermarket sector and is it a competitive one?

METHODOLOGY

This project proposes a methodological approach consisting of four (4) phases.

Phase I consisted of a "Poll Analysis", using Facebook as our main platform. According to the 2017 Internet World Stats[4], from the total 105,670 Aruban citizens, 100,000 are internet users, from which 91,000 are Facebook subscribers. This provided an opportunity to obtain a closer representation of the total population of Aruba. Properly conducted public opinion polls have a good record in achieving unbiased samples. Different organizations use different methodologies and there is considerable controversy about which method is most accurate. However, this research proposed a straightforward approach in order to measure the citizens' sentiment to the current availability of the supermarkets on the island.

For Phase II, a "Spatial Analysis" was conducted to explore the level of spatial congestion and ratio between the amount of supermarkets with each Region/Region Size, Zone/Zone Size, and number of habitants per Region and per Zone. Specific Geographical Information System (GIS) data was requested and obtained from the Central Bureau of Statistics Aruba (CBS) where the above-mentioned information were analyzed and presented (see Appendix I for the classification of Regions and Zones for Aruba). The use of Geographical Information System (GIS) presented several advantages, as it had the capacity to integrate information related to geographical position and produce thematic maps and other data visualizations. This made it possible to provide spatial analysis of locations integrating demographic variables and possible characteristics of the customers. Besides that, regional and international institutions were approached to obtain their feedback on the challenges or "best practices" related to this matter[5].

Phase III consisted a consumer "Sentiment Analysis", using a 6-point Likert Scale questionnaire that was distributed online via the social media channel Facebook. A random sampling technique was used where a sample was drawn so that each member of Aruba's population has an equal and independent chance of being included in the sample. Sample findings were then be generalized to a known population. The 6-point Likert Scale questionnaire was also translated to Papiamento (Aruba's native language), as not everyone reads English fluently while some prefer to answer the questions in their own native language and to avoid any response bias.

Phase IV consisted of a "Market Structure Analysis" analyzing Aruba's "Herfindahl-Hirshman Index" (henceforth HHI), the "Consumer Price Index" (henceforth CPI) and the "Market Growth Index". The current view and explanation for the moratorium on the supermarket industry is that the industry is saturated, resulting in a negative impact on society. Further explanation of the HHI can be obtained in Appendix 2 of this document. The following three characteristics describe a saturated market; (1) market competition is high, (2) market prices are low, and (3) market growth is low. This paper challenged this view by testing the following three alternative hypothesis. The first element of a saturated market is fierce competition. The U.S. Department of Justice considers a market with an HHI of less than 1,500 to be a competitive marketplace. Therefore, when we test the first hypothesis; if the HHI is greater than 1,500, it is not considered competitive. Effectively falsifying the first premise that supports the claim to market saturation.

[4] https://www.internetworldstats.com/carib.htm

[5] Interview with Mr. Louelo Girigorie, Director "Ministerie Economische Ontwikkeling Curaçao.

H_1: The market structure of a non-saturated supermarket industry is highly concentrated.

Data on supermarket revenues was collected from the Tax Department's administrative database. There are 164 units of observation in the year 2016, of which 57 units are missing data. In cases of missing data, the total revenues of each individual unit was estimated by extrapolation and/or interpolation based on available data. The HHI was computed both including and excluding the firms with missing data. The difference between the two indices is never more than one percent over the sample period.

The second aspect of a saturated market is low prices. Because prices are continuously rising, we cannot make a comparison of absolute price against some benchmark. Instead, we compare the rate at which price is increasing to the rate of increase of a benchmark. In this case, we opted for the rate of increase of the CPI of all consumer products; the rate of increase of the Global CPI food; and finally the rate of increase of crude. Testing the second hypothesis, if local food prices are increasing at a faster rate than these three benchmarks, price cannot be considered low. Again, falsifying the second premise to support the claim to market saturation.

H_2: The prices of food products in a non-saturated supermarket industry are high.

Data on the Consumer Price Index of food on Aruba was reported by the Central Bureau of Statistics. For comparison, data was also collected on the Global Food Price Index from the 'Food and Agriculture Organization of the United States' and the price of crude from the 'Federal Reserve Bank of St. Louis'. The percentage change was computed for all three.

The third and final characteristic of a saturated market was slow growth. Similar to the second hypothesis, there was no absolute benchmark for slow growth. Yet, we can compare the growth of an industry to the growth of the population. In this case, we opted to measure the growth of employment within the Supermarket industry. Since, a growing industry will hire more employees, it make sense to measure employment growth. Testing the third hypothesis, if the industry was growing at a faster rate than that of the overall population, the growth cannot be considered low. Once more, falsifying the third premise to support the claim to market saturation.

H_3: The growth rate of the non-saturated supermarket industry is greater than the population growth.

Data on the total number of employees within the supermarket industry was collected from the SVB on a quarterly basis. The growth rate of the supermarket industry was computed as the average change in number of employees per quarter. In much the same way, the growth rate of the population was computed as the average change in population size per quarter. The Central Bureau of Statistics reported data on population size. The above-mentioned methodologies were conducted during the months of September and October of 2018.

RESULTS/FINDINGS, LIMITATIONS, RECOMMENDATIONS.

Results Phase I (Polling).

Phase I consisted of a straightforward polling methodology, which was programmed for two (2) weeks, starting from October 19 until November 2nd, 2018. From this exercise, 15,266 people were reached, 2,197 people engaged with the poll, 63 participants left a comment and 52 shares were conducted. From the above-mentioned numbers, 1,800 respondents were obtained which 94% chose to see less supermarket development on Aruba and 6% chose to see more supermarket development on Aruba.

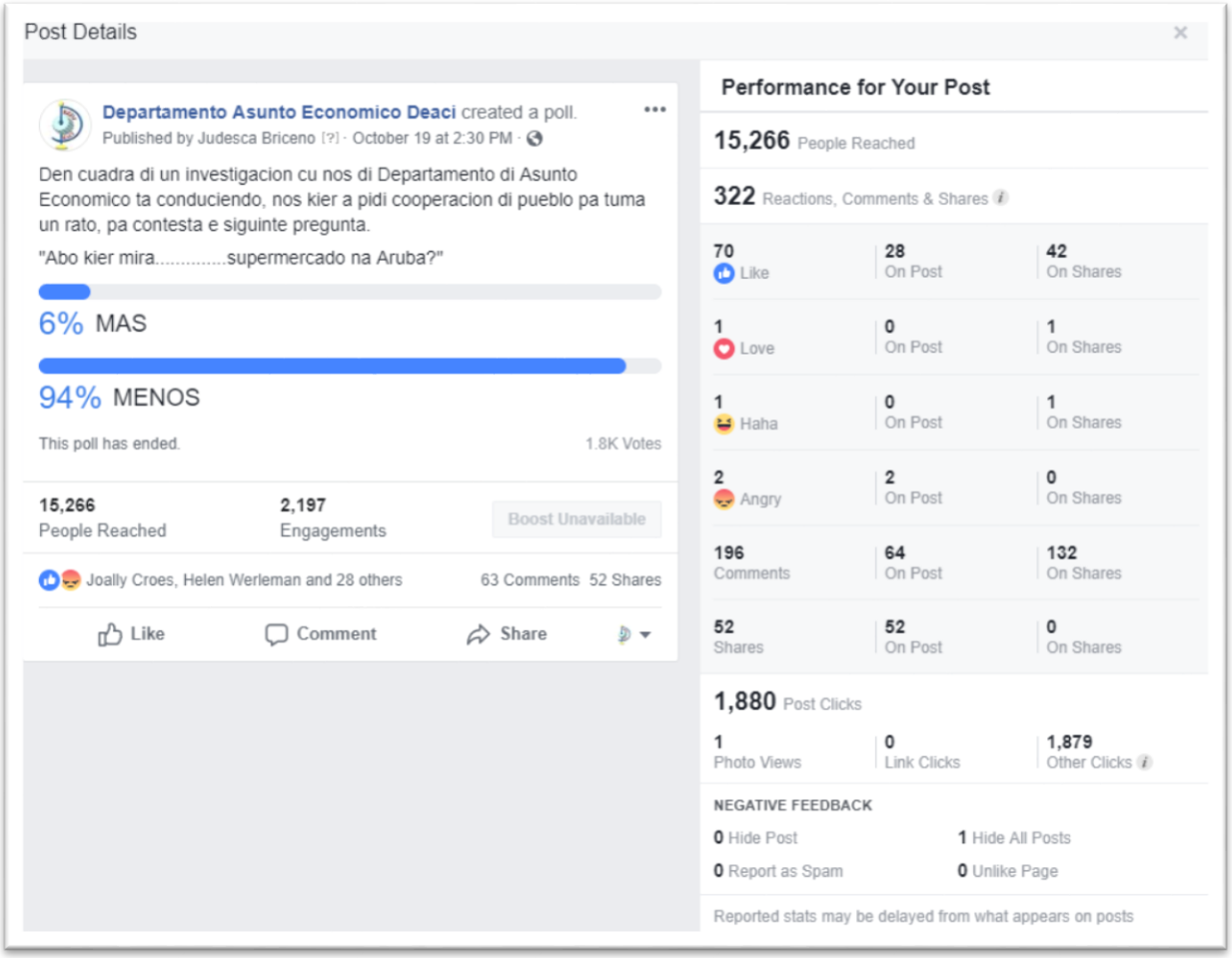


Figure 1: Departamento Asunto Economico DEACI Poll Results October 2018

Results Phase II (Geospatial Results)

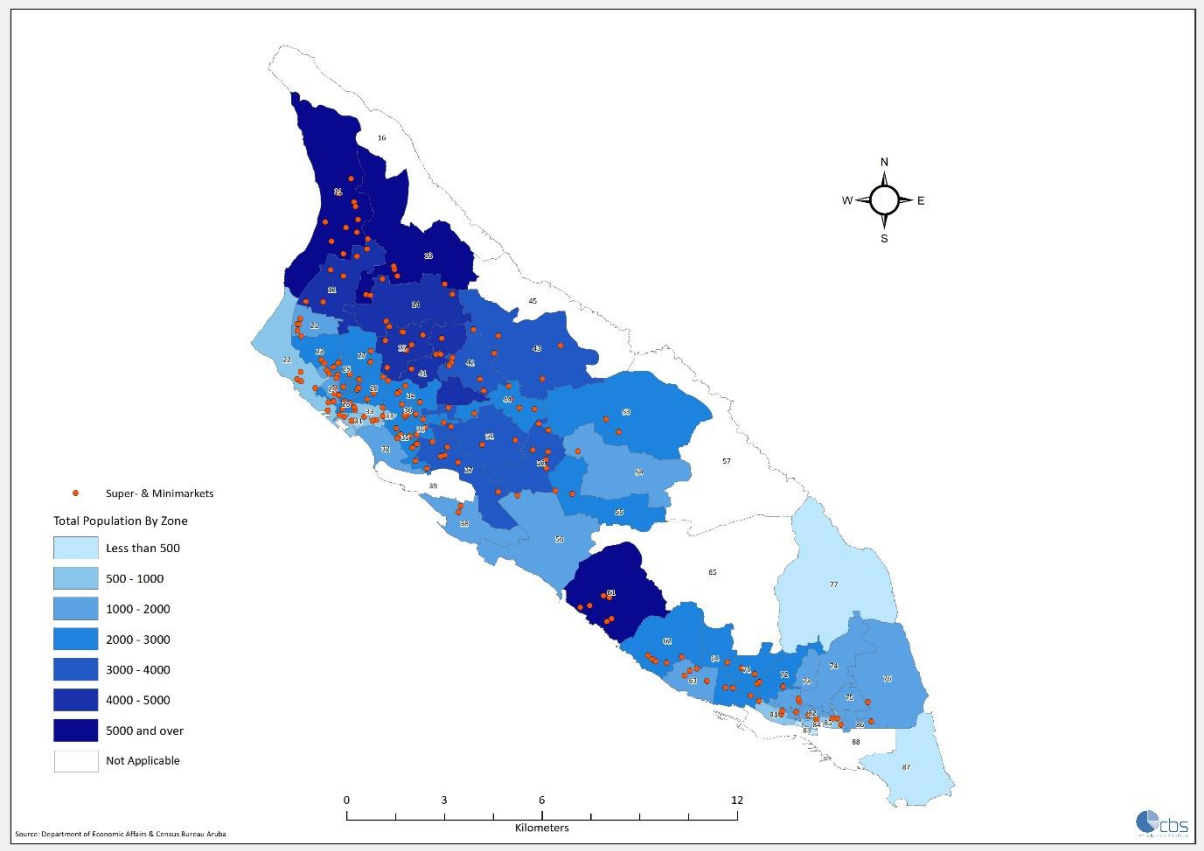


Figure 2: Total Supermarkets on Aruba based on Total Population by Zones (Source: CBS).

The official GIS model provided by the Central Bureau of Statistics (henceforth CBS) classifies the geographical location of the island into 8 Regions and 55 Zones (see Appendix 1). Above illustrated figure (Figure 2), provides the location of all registered supermarkets (illustrated with dark orange dots), and their placement within the different "Regions" based on the average total population by "Zone". The highest concentration lies in the West-Southwest region of the island and to a certain extent in the East-Southeast region of the island.

Figure 2 clearly illustrates that the concentrations of supermarkets are already present in regions of 500-1000 habitants. The following figures (3-9) provides a closer illustration of the total amount of supermarkets per zone. Please note that the median (the middle-most value) was used for the Household Income. The median is a more accurate representation of the typical Aruban income compared to the mean score (dividing the total combined income of all Arubans by the number of incomes). Using a mean score could be misleading because of a few wealthy citizens.

Please note that for Tables 1-8, a "subjective" number two (2) was proposed (highlighted in blue) as a threshold to illustrate those Zones that possess 2 or less supermarkets and are therefore not considered to be congested.

Ratios of number of habitants per supermarkets, number of supermarkets per Km2 per region were also presented on Tables 1-8. Total Tax Revenue per zones were not obtained by the Tax Department, which was suggested as a Proxy for supermarket sizes.

Results Zone 1 Noord/Tanki Leendert.

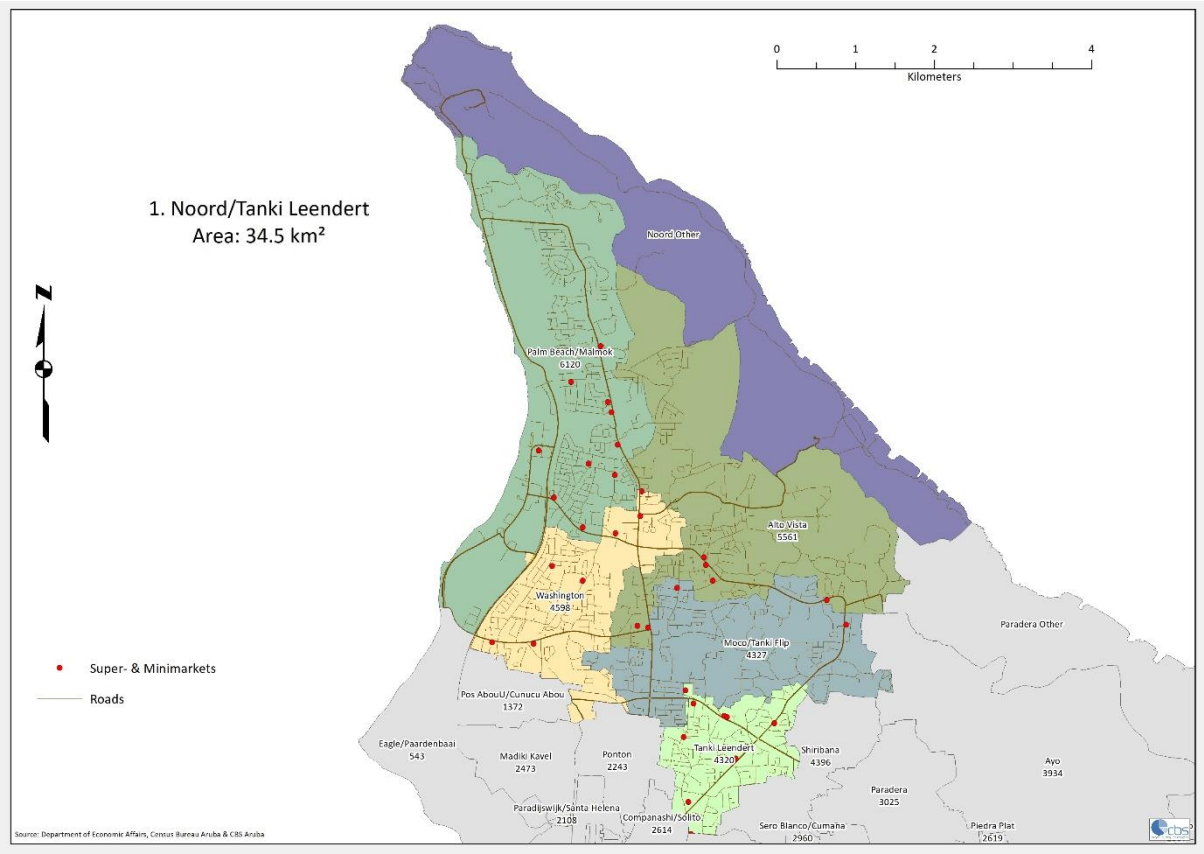


Figure 3: Total Supermarkets Region 1 Noord/Tanki Leendert (Source: CBS).

Region 1 (Noord/Tanki Leendert) consist of 6 Zones with a total of 36 supermarkets, and within an area of 34.5 km2. The average habitant per supermarket is 692 and the median Household Income is Afls 4,250. The highest concentration lies in Zones “Palm Beach/Malmok” (10 supermarkets with 6,120 habitants) and Tanki Leendert (10 supermarkets with 4,320 habitants). Zones Washington (7 supermarkets with 4,598 habitants) and Alto Vista (7 supermarkets with 5,561 habitants) are also considered to be highly concentrated areas. Please refer to Table 1.

Table 1: Breakdown of Region 1 with Zones, Supermarkets and Habitants.

REGION #	REGION NAME(S)	ZONE #	NAME ZONE	# super-markets	Area Km2 per Zone	Sup/Km2	# Habitants*	Median Household Income/REG **
1	NOORD/TANKI LEENDERT	11	Palm Beach/Malmok	10	8.3	1.2	6,120	
		12	Washington	7	3.4	2.1	4,598	
		13	Alto Vista	7	7.8	0.9	5,561	
		14	Moco/Tanki Flip	2	4.3	0.5	4,327	
Area km2		15	Tanki Leendert	10	2.1	4.8	4,320	
34.5		16	Noord Overig	0	8.6	0.0	0	
			TOTAL	36			24,926	
			RATIO/MEAN/MEDIAN				692	4,250
							692 hab per sup	

* Department of Civil Status and Population Register. **Median Household Income Results CBS Income & Expenditure Survey 2016

Source: Central Bureau of Statistics Aruba.

Results Zone 2 Oranjestad-West.

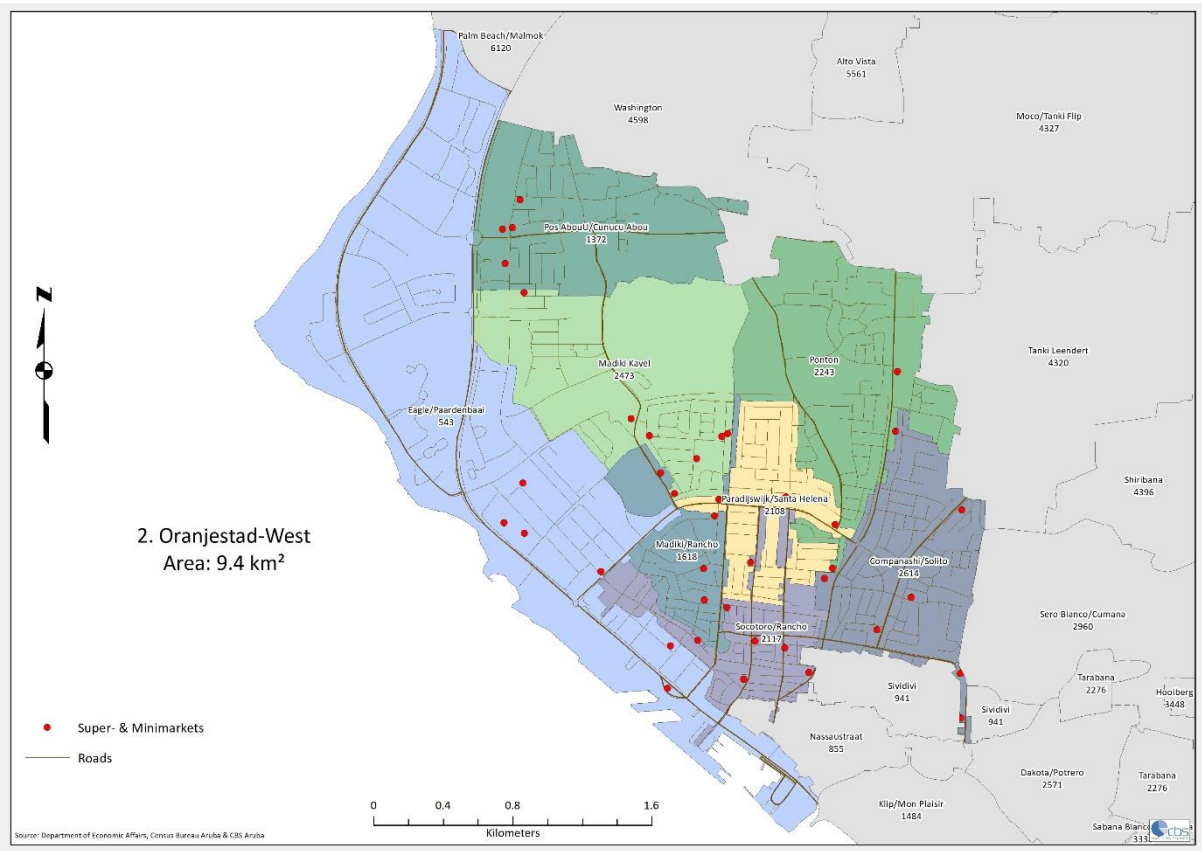


Figure 4: Total Supermarkets Region 2 Oranjestad West (Source: CBS).

Region 2 (Oranjestad-West) consist of 8 Zones with a total of 39 supermarkets, and within an area of 9.4 km2. The average habitant per supermarket is 387 and the median Household Income is Afls 3,175. The highest concentration lies in Zones

“Eagle/Paardenbaai” (7 supermarkets with 543 habitants) and Socotoro/Rancho (7 supermarkets with 2,117 habitants). Zone Companashi/Solito (6 supermarkets with 2,614 habitants) is also considered as a highly concentrated area. Please refer to Table 2.

Table 2: Breakdown of Region 2 with Zones, Supermarkets and Habitants.

REGION #	REGION NAME(S)	ZONE #	NAME ZONE	# super-markets	Area Km2 per Zone	Sup/Km2	# Habitants*	Median Household Income/REG **
2	ORANJESTAD-WEST	21	Pos Abao/Cunucu Abao	3	1	3.0	1,372	
		22	Eagle/Paardenbaai	7	3.4	2.1	543	
		23	Madiki Kavel	5	1.4	3.6	2,473	
		24	Madiki /Rancho	5	0.4	12.5	1,618	
		25	Paradijswijk/Santa Helena	4	0.5	8.0	2,108	
		26	Socotoro/Rancho	7	0.5	14.0	2,117	
Area km2		27	Ponton	2	1.3	1.5	2,243	
9.4		28	Companashi/Solito	6	0.9	6.7	2,614	
			TOTAL	39			15,088	
			RATIO/MEAN/MEDIAN				387	3,175
							387 hab per sup	

* Department of Civil Status and Population Register. **Median Household Income Results CBS Income & Expenditure Survey 2016

Source: Central Bureau of Statistics Aruba.

Results Zone 3 Oranjestad-East.

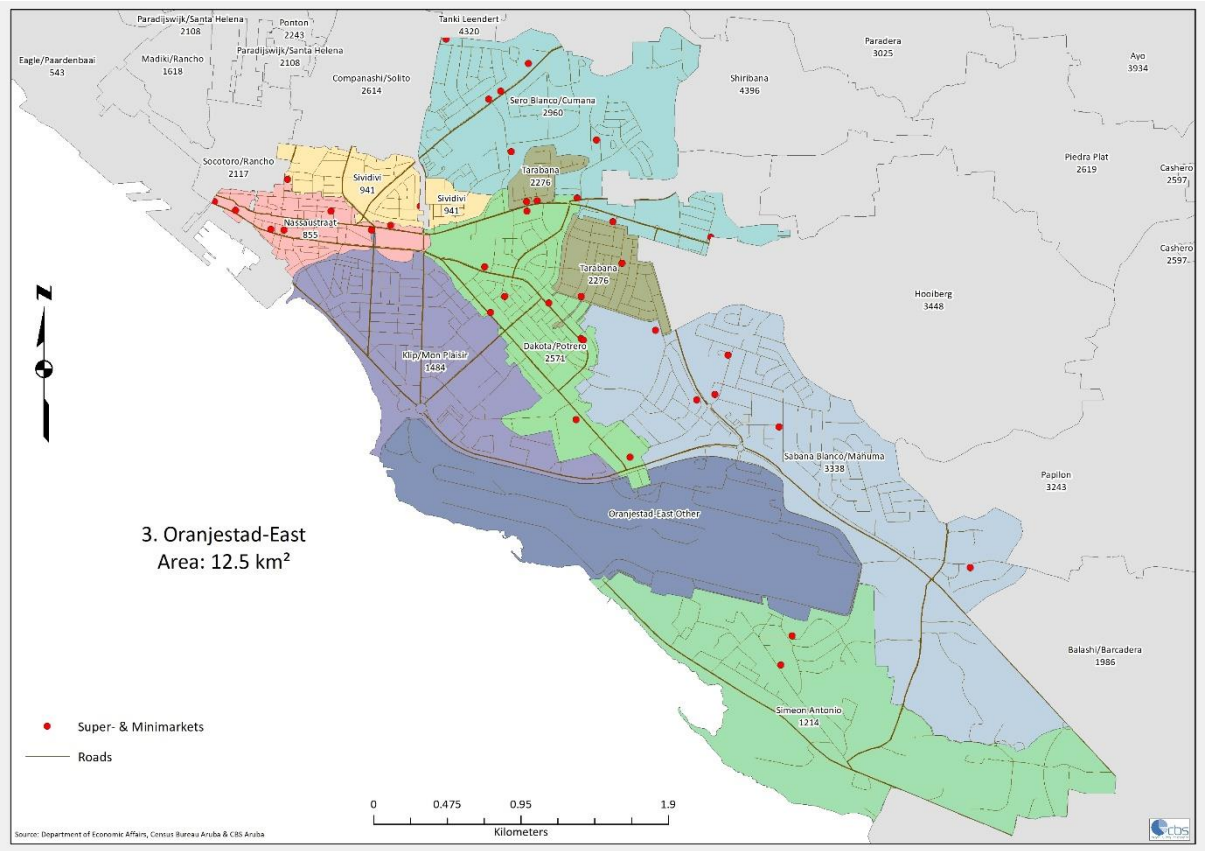


Figure 5: Total Supermarkets Region 3 Oranjestad-East (Source: CBS).

Region 3 (Oranjestad-East) consist of 9 Zones with a total of 39 supermarkets, and within an area of 12.5 km2. The average habitant per supermarket is 401 and the median Household Income is Afls 3,000. The highest concentration lies in Zones "Dakota/Potrero" (11 supermarkets with 2,571 habitants). Zone Nassaustraat (8 supermarkets with 855 habitants) and Sero Blanco/Cumana (8 supermarkets with 2,960 habitants) are also considered as a highly concentrated areas. Please refer to Table 3.

Table 3: Breakdown of Region 3 with Zones, Supermarkets and Habitants.

REGION #	REGION NAME(S)	ZONE #	NAME ZONE	# super-markets	Area Km2 per Zone	Sup/Km2	# Habitants*	Median Household Income/REG **
3	ORANJESTED-EAST	31	Nassaustraat	8	0.4	20.0	855	
		22	Klip/Mon Plaisir	0	1.3	0.0	1,484	
		33	Sividivi	0	0.4	0.0	941	
		34	Sero Blanco/Cumana	8	1.7	4.7	2,960	
		35	Dakota/Potrero	11	1.1	10.0	2,571	
		36	Tarabana	4	0.5	8.0	2,276	
		37	Sabana Blanco/Mahuma	6	3	2.0	3,338	
Area km2		38	Simeon Antonio	2	2.3	0.9	1,214	
12.5		39	Oranjestad Oost Overg	0	1.9	0.0	0	
			TOTAL	39			15,639	
			RATIO/MEAN/MEDIAN				401	3,000
							401 hab per sup	

* Department of Civil Status and Population Register. **Median Household Income Results CBS Income & Expenditure Survey 2016

Source: Central Bureau of Statistics Aruba.

Results Zone 4 Paradera.

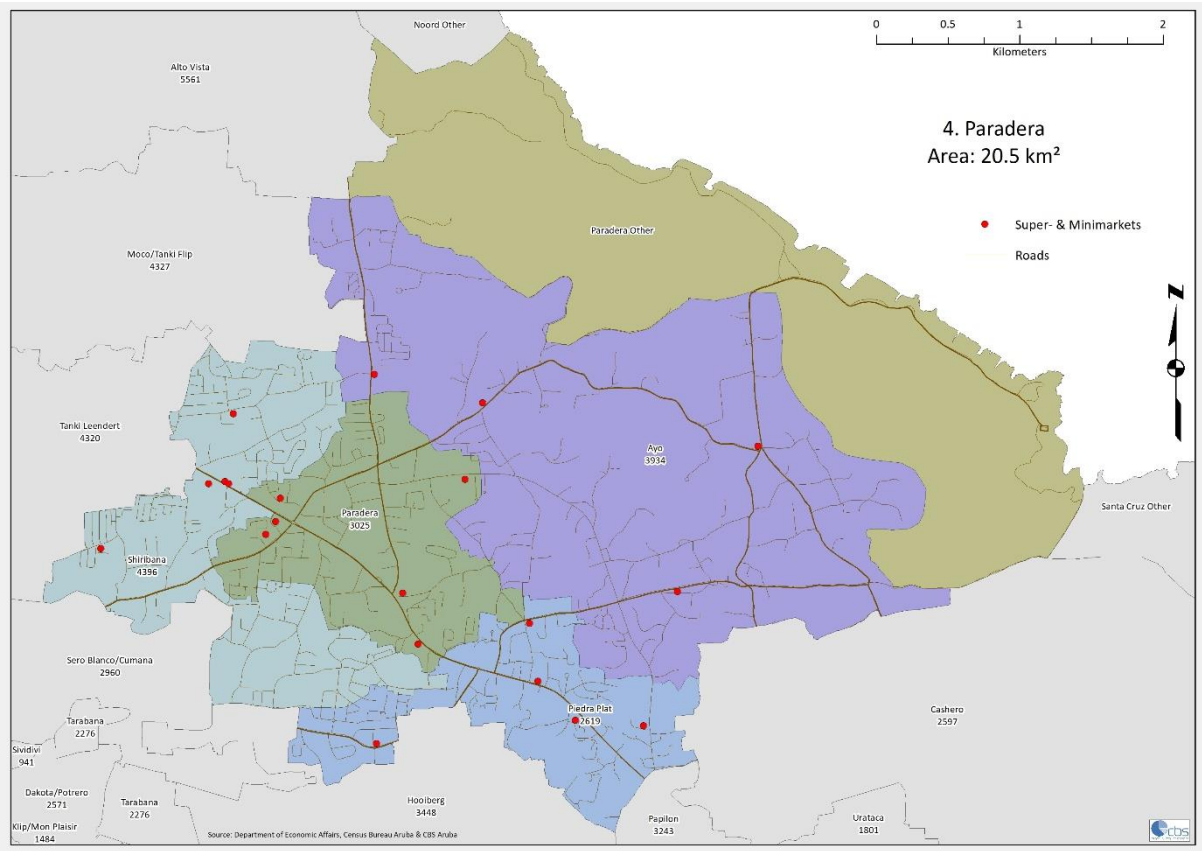


Figure 6: Total Supermarkets Region 4 Paradera (Source: CBS).

Region 4 (Paradera) consist of 5 Zones with a total of 20 supermarkets, and within an area of 20.5 km2. The average habitant per supermarket is 699 and the median Household Income is Afls 4,173. The highest concentration lies in Zones "Paradera" (6 supermarkets with 3,025 habitants). Zone Shiribana (5 supermarkets with 4,396 habitants) and Piedra Plat (5 supermarkets with 2,619 habitants) are also considered as a highly concentrated areas. Please refer to Table 4.

Table 4: Breakdown of Region 4 with Zones, Supermarkets and Habitants.

REGION #	REGION NAME(S)	ZONE #	NAME ZONE	# super-markets	Area Km2 per Zone	Sup/Km2	# Habitants*	Median Household Income/REG **
4	PARADERA	41	Shiribana	5	2.7	1.9	4,396	
		42	Paradera	6	2.2	2.7	3,025	
		43	Ayo	4	7.4	0.5	3,934	
Area km2		44	Piedra Plat	5	1.9	2.6	2,619	
20.5		45	Paradera Overig	0	6.3	0.0	0	
			TOTAL	20			13,974	
			RATIO/MEAN/MEDIAN				699	4,173
							699 hab per sup	

* Department of Civil Status and Population Register. **Median Household Income Results CBS Income & Expenditure Survey 2016

Source: Central Bureau of Statistics Aruba.

Results Zone 5 Santa Cruz.

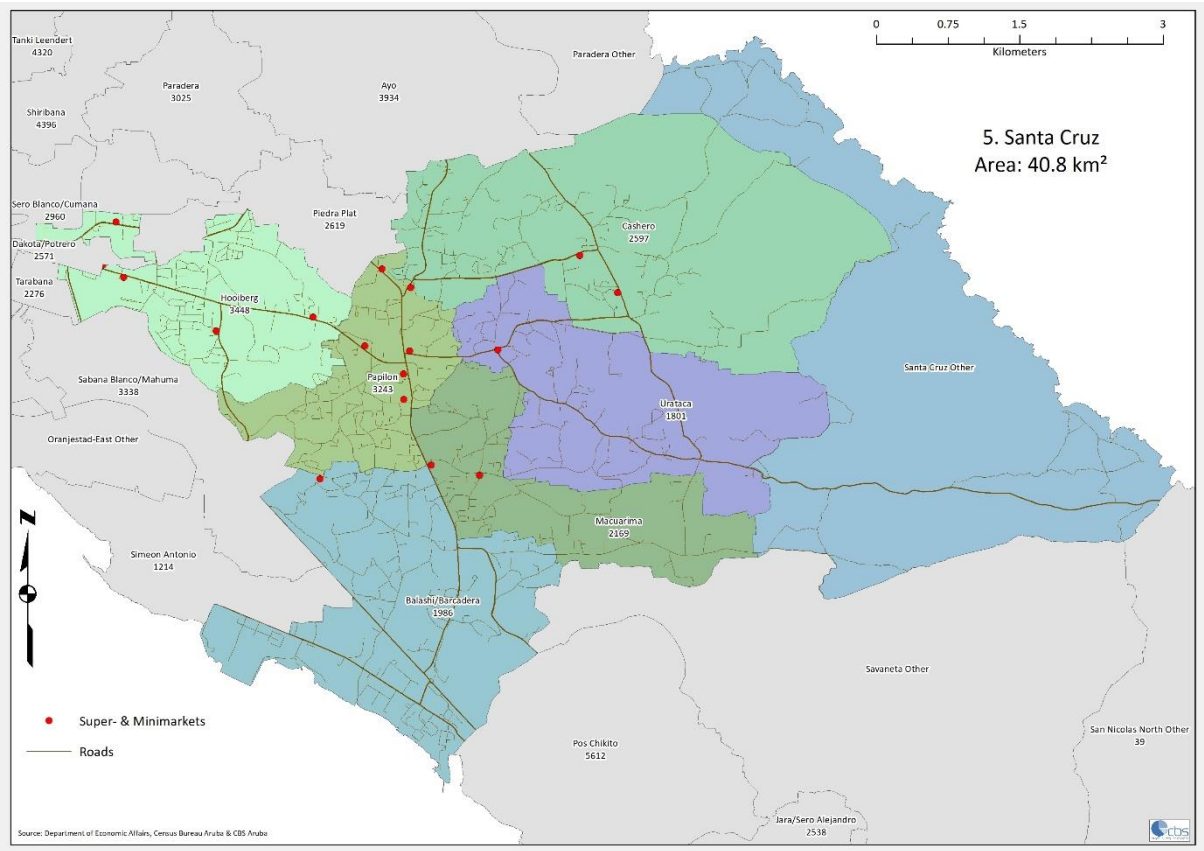


Figure 7: Total Supermarkets Region 5 Santa Cruz (Source: CBS).

Region 5 (Santa Cruz) consist of 7 Zones with a total of 16 supermarkets, and within an area of 40.8 km2. The average habitant per supermarket is 953 and the median Household Income is Afls 3,988. The highest concentration lies in Zones "Papilon" (6 supermarkets with 3,243 habitants). Zone Hooiberg (4 supermarkets with 3,448 habitants) is also considered as a highly concentrated area. Please refer to Table 5.

Table 5: Breakdown of Region 5 with Zones, Supermarkets and Habitants.

REGION #	REGION NAME(S)	ZONE #	NAME ZONE	# super-markets	Area Km2 per Zone	Sup/Km2	# Habitants*	Median Household Income/REG **
5	SANTA CRUZ	51	Hooiberg	4	3.6	1.1	3,448	
		52	Papilon	6	2.8	2.1	3,243	
		53	Cashero	2	8.9	0.2	2,597	
		54	Urataca	1	5.2	0.2	1,801	
		55	Macuarima	2	3.5	0.6	2,169	
Area km2		56	Balashi/Barcadera	1	6.2	0.2	1,986	
40.8		57	Santa Cruz Overig	0	11.4	0.0	0	
			TOTAL	16			15,244	
			RATIO/MEAN/MEDIAN				953	3,988
							953 hab per sup	

* Department of Civil Status and Population Register. **Median Household Income Results CBS Income & Expenditure Survey 2016

Source: Central Bureau of Statistics Aruba.

Results Zone 6 Savaneta.

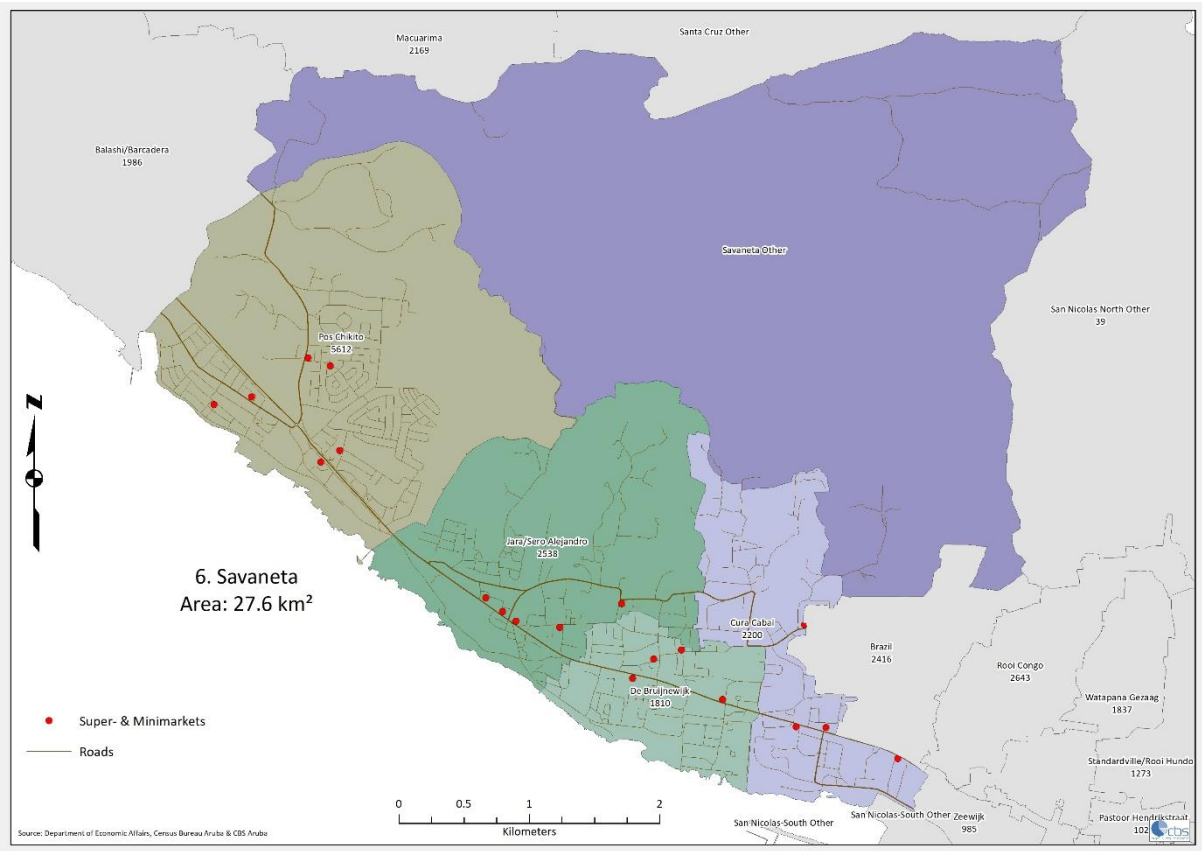


Figure 8: Total Supermarkets Region 6 Savaneta (Source: CBS).

Region 6 (Savaneta) consist of 5 Zones with a total of 19 supermarkets, and within an area of 27.6 km2. The average habitant per supermarket is 640 and the median Household Income is Afls 3,719. The highest concentration lies in Zones “Pos Chikito” (6 supermarkets with 5,612 habitants). Zone “Jara/Sero Alejandro” (5 supermarkets with 2,538 habitants) is also considered as a highly concentrated area. Please refer to Table 6.

Table 6: Breakdown of Region 6 with Zones, Supermarkets and Habitants.

REGION #	REGION NAME(S)	ZONE #	NAME ZONE	# super-markets	Area Km2 per Zone	Sup/Km2	# Habitants*	Median Household Income/REG **
6	SAVANETA	61	Pos Chikito	6	5.9	1.0	5,612	
		62	Jara/Sero Alejandro	5	3.7	1.4	2,538	
		63	De Bruynewijk	4	1.4	2.9	1,810	
Area km2		64	Cura Cabai	4	2.1	1.9	2,200	
27.6		65	Savaneta Overig	0	14.4	0.0	0	
			TOTAL	19			12,160	
			RATIO/MEAN/MEDIAN				640	3,719
						640 hab per sup		

* Department of Civil Status and Population Register. **Median Household Income Results CBS Income & Expenditure Survey 2016

Source: Central Bureau of Statistics Aruba.

Results Zone 7 San Nicolas-North.

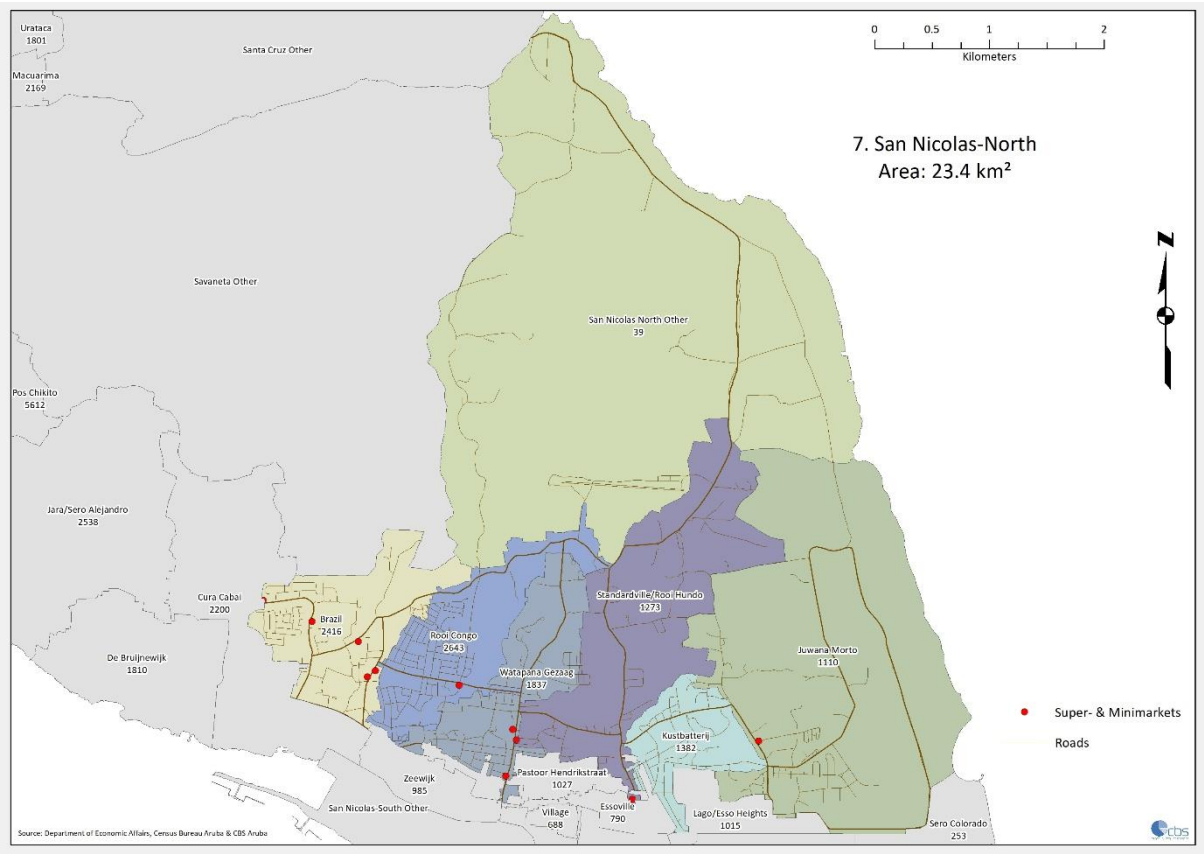


Figure 9: Total Supermarkets Region 7 San Nicolas-North (Source: CBS)

Region 7 (San Nicolas-Noord) consist of 7 Zones with a total of 10 supermarkets, and within an area of 23.4 km2. The average habitant per supermarket is 1,070 and the median Household Income is Afls 3,817. The highest concentration lies in Zones "Brasil" (4 supermarkets with 2,416 habitants) and "Watapana Gezag (4 supermarkets with 1,837 habitants). Please refer to Table 7.

Table 7: Breakdown of Region 7 with Zones, Supermarkets and Habitants.

REGION #	REGION NAME(S)	ZONE #	NAME ZONE	# super-markets	Area Km2 per Zone	Sup/Km2	# Habitants*	Median Household Income/REG **
7	SAN NICOLAS-NOORD	71	Brasil	4	1.5	2.7	2,416	
		72	Rooi Congo	1	1.4	0.7	2,643	
		73	Watapana Gezag	4	1.2	3.3	1,837	
		74	Standard Ville/Rooi Hundo	0	2.7	0.0	1,273	
		75	Kustbatterij	0	0.8	0.0	1,382	
Area km2		76	Juwana Morto	1	5.4	0.2	1,110	
23.4		77	San Nicolas Noord Overg	0	10.5	0.0	39	
			TOTAL	10			10,700	
			RATIO/MEAN/MEDIAN				1,070	3,817
							930 hab per sup	

* Department of Civil Status and Population Register. **Median Household Income Results CBS Income & Expenditure Survey 2016

Source: Central Bureau of Statistics Aruba.

Results Zone 8 San Nicolas-South.

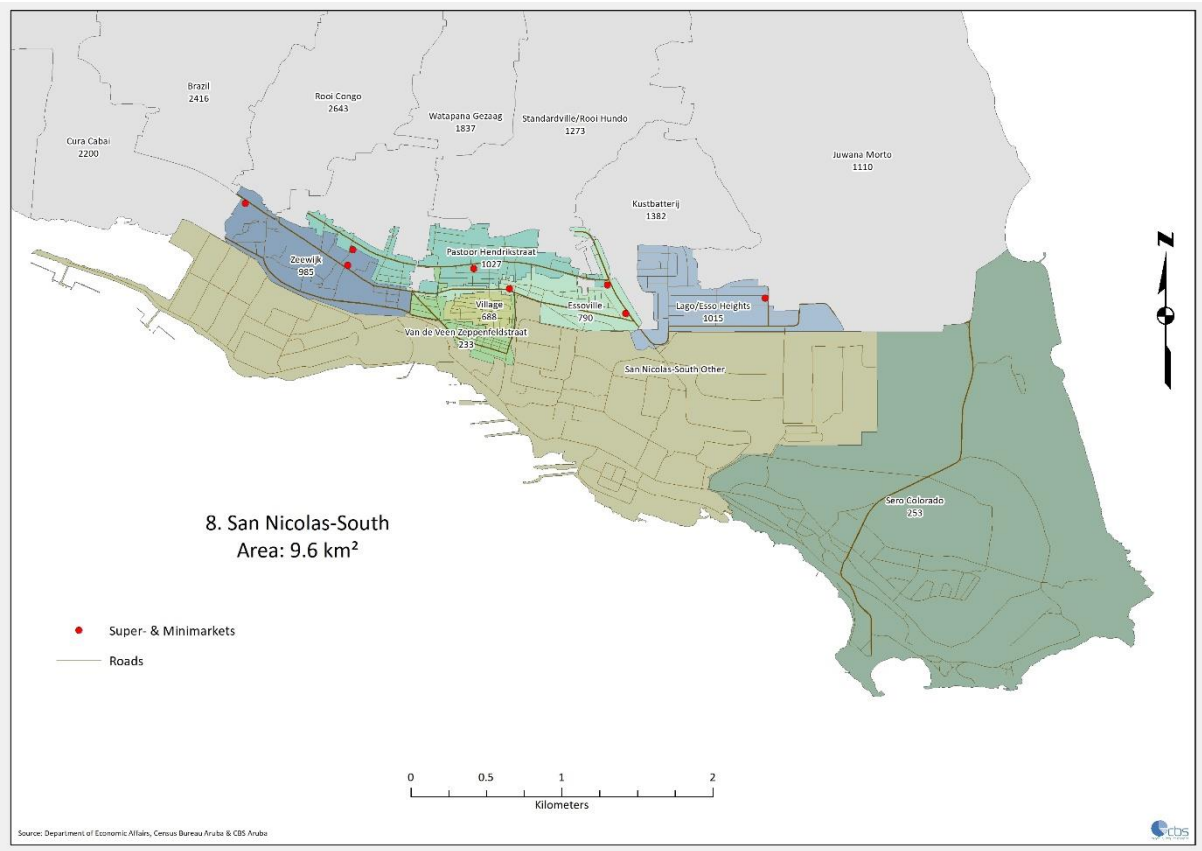


Figure 10: Total Supermarkets Region 8 San Nicolas-South (Source CBS).

Region 8 (San Nicolas-South) consist of 8 Zones with a total of 8 supermarkets, and within an area of 9.6 km2. The average habitant per supermarket is 1,070 and the median Household Income is Afls 1,837. The highest concentration lies in Zone "Essoville" (4 supermarkets with 790 habitants). Zone "Zeewijk" (2 supermarkets with 985 habitants) is also considered as a highly concentrated area. Please refer to Table 8.

Table 8: Breakdown of Region 8 with Zones, Supermarkets and Habitants.

REGION #	REGION NAME(S)	ZONE #	NAME ZONE	# super-markets	Area Km2 per Zone	Sup/Km2	# Habitants*	Median Household Income/REG **
8	SAN NICOLAS-SOUTH	81	Zeewijk	2	0.5	4.0	985	
		82	Pastoor Hendrikstraat	1	0.4	2.5	1,027	
		83	van de Veen Zeppenv	0	0.1	0.0	233	
		84	Village	0	0.1	0.0	688	
		85	Essoville	4	0.3	13.3	790	
		86	Lago/Esso Heights	1	0.4	2.5	1,015	
Area km2		87	Sero Colorado	0	4.4	0.0	253	
9.6		88	San Nicolas Zuid Overg	0	3.4	0.0	0	
			TOTAL	8			4,991	
			RATIO/MEAN/MEDIAN				624	1,837
							624 hab per sup	

* Department of Civil Status and Population Register. **Median Household Income Results CBS Income & Expenditure Survey 2016

Source: Central Bureau of Statistics Aruba.

It is important to highlight that Region 1 (Noord/Tanki Leendert) and Region 2 (Oranjestad-West) are those that have the largest supermarkets qua size in their area, and are known to have a large number of tourists visiting these supermarkets. Region 1 has Superfood and Save-A-Lot and Region 2 Ling and Sons and Kong Hing supermarket. A breakdown of their percentage of tourists versus local was requested but not obtained.

The following table (Table 9) provides a summary of the above-mentioned indicators per Region. Besides providing an overall view of the status of the supermarkets on the island, the main purpose for this table is expand in comparing three (3) key indicators. They are: "Region Number", "Habitants per Supermarket" and "Km2 per Supermarket". The "Habitants per Supermarket" was obtained by dividing the total Habitants by the number of Supermarkets and the "Km2 per Supermarket" was divided by the total Km2 by the number of Supermarkets of that Region. The latter was square rooted afterwards.

Table 9: Summary of Indicators of each Region.

REGION #	REGION NAME(S)	# of ZONES	# supermarkets	Habitants*	Hab/Superm	Km2	Km2/Sup	(√) Km2/Sup***	Median HHI**
1	NOORD/TANKI LEENDERT	6	36	24,926	692	34.5	0.96	0.98	4,250
2	ORANJESTAD-WEST	8	39	15,088	387	9.4	0.24	0.49	3,175
3	ORANJESTED-EAST	9	39	15,639	401	12.5	0.32	0.57	3,000
4	PARADERA	5	20	13,974	699	20.5	1.03	1.01	4,173
5	SANTA CRUZ	7	16	15,244	953	40.8	2.55	1.60	3,988
6	SAVANETA	5	19	12,160	640	27.6	1.45	1.21	3,719
7	SAN NICOLAS-NOORD	7	10	10,700	1,070	23.4	2.34	1.53	3,817
8	SAN NICOLAS-SOUTH	8	8	4,991	624	9.6	1.20	1.10	1,837

* Department of Civil Status and Population Register. **CBS Income & Expenditure Survey 2016, ***√ of Km2/Sup

Source: Central Bureau of Statistics Aruba.

A threshold of thousand (1000) habitants and one (1) supermarket per Km2 were proposed as a congestion level for each of the Regions. In other words, one supermarket per 1 Km2 range is proposed to be congested. The following figure (Figure 11) provides an indication of the congestion level for each Region.

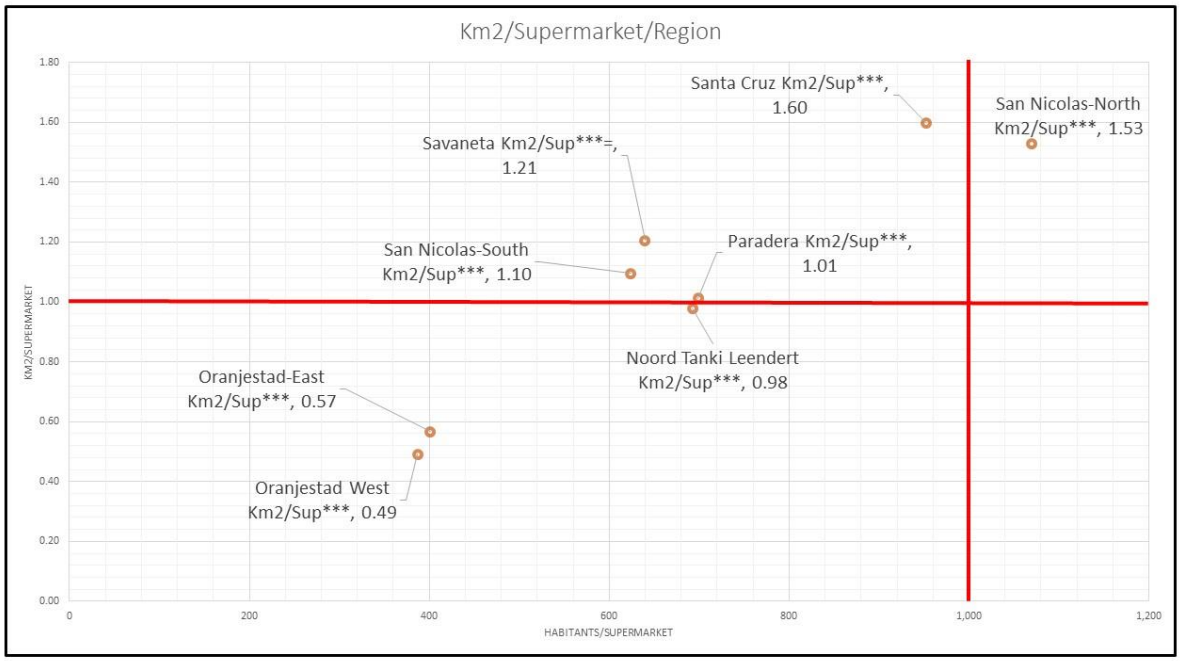


Figure 11: Level of Saturation of supermarkets per Region.

Based on the above-mentioned proposition, three Regions (Oranjestad-East, Oranjestad-West and Noord/Tanki Leendert) are considered to be congested. Potential Regions for congestion are San-Nicolas-South and Paradera, followed by Savaneta and Santa Cruz. Region San Nicolas-North is the only Region that has the potential for additional supermarkets. However, this calculation was only based on looking at the ratio between total supermarkets, total habitants and Km2 per Region and must not be considered as the only variable for decision-making purposes. Additional geographical, economic/financial and logistical indicators such as total financial turnover of supermarkets per Km2 was desired in order to obtain an objective ratio as a proxy to measure congestion level in each Region and Zone.

Results Phase III (Survey)

During the month November of 2018 (November 6-26), a survey was posted on social media (Facebook), with request to local citizens to fill out the survey and suggest friends and families to also participate. This request was to mainly obtain a snowball effect with other respondents on the island and to obtain a valid representation of the population of Aruba. A total of 415 habitants responded to the online survey, and based on the demographics characteristics of the sampled respondents, we can conclude that the population is well represented by the sample we obtained. The following table (Table 10) provides an indication of which Zone each of the respondent live at.

Table 10: Respondents' Zone names.

Zone names	# respondents	Zone names	# respondents
Alto Vista	7	Paradijs/Santa Helena	12
Ayo	6	Paredera overig	1
Balashi/Barcadera	1	Pastoor Hendrikstraat	3
Brasil	8	Piedra Plat	9
Cashero	2	Pos Abou/Cunucu Abou	9
Companashi/Solito	8	Pos Chikito	7
Cura Cabai	2	Sabana Blanco/Mahuma	5
Dakota/Portero	5	San Nicolas Noord overig	4
Eagle/Paardenbaai	2	San Nicolas Zuid overig	2
Essoville	2	Santa Cruz overig	21
Hooiberg	20	Savaneta overig	9
Jara/Sero Alejandro	4	Sero Blanco/Cumana	18
Juwana Morto	3	Shiribana	2
Klip/Mon Plaisir	8	Simeon Antonio	2
Lago/Esso Heights	1	Sividivi	4
Macuarima	4	Socotorro/Rancho	6
Madiki Kavel	4	Standard Ville/Rooi Hundo	2
Madiki/Rancho	6	Tanki Leendert	31
Moco/Tanki Flip	15	Tarabana	5
Noord overig	25	Urataca	3
Oranjestad Oost overig	13	Washington	9
Palm Beach/Malmok	16	Watapana Gezag	1
Papilon	7	Grand Total	378
Paradera	32		
Paradera overig	12		

A total of 36 questions were used in the survey, of which 26 Likert Scale questions were categorized based on the following variables. They are: a) Perceived Social Cost; b) Environmental Sustainability; c) Long Term Planning; d) Perceived Economic Benefit; e) Neighborhood Centered Economy; f) Ensuring Client Satisfaction; g) Maximizing Neighborhood Participation; and h) Quality of Life.

Using the deductive reasoning approach, these variables were derived by an existing study using an attitudinal scale to measure the residents' attitudes toward sustainable development within the tourism sector[6]. The remainder questions consisted of descriptive types of questions, including demographics at the end. The following Tables and Figures will illustrate the results obtained from each variable and its corresponding questions.

Please note that each question and its corresponding result must be evaluated with caution, and regardless of the conclusions provided for each section, they are not meant to be used as a sole argument to justify the current moratorium in place.

[6] Yu, C., Chancellor, H.C., Cole, S.T. (2009). Measuring Residents' Attitudes toward Sustainable Tourism: A reexamination of the sustainable tourism attitude scale. Journal of Travel Research. Vol 1-7.

The variable "**Perceived Social Cost**" consisted of 5 questions that were considered to provide an indication of the social costs associated with supermarket development on the island. Figures 12-16 illustrates the results obtained.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

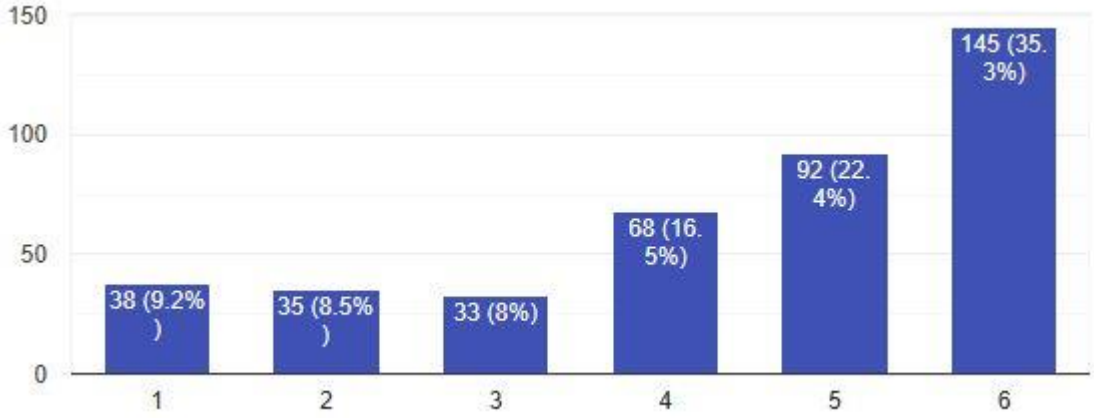


Figure 12: Results Variable Perceived Social Cost Question 1 "The amount of supermarkets in my neighborhood meet my needs and my living conditions" / (mean score = 4).

Figure 12 indicates that the majority of the respondents (35.3%) agreed that the amount of supermarkets meet their needs and living conditions. This result could contradict the current perception locals have towards the total numbers of supermarkets, or could even indicate that the level of convenience for their needs and living conditions offered by number of supermarkets is not directly related to the current perception of the island having too many of these establishment. It can be concluded with this question that their current needs are met with the current number of supermarkets on the island.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

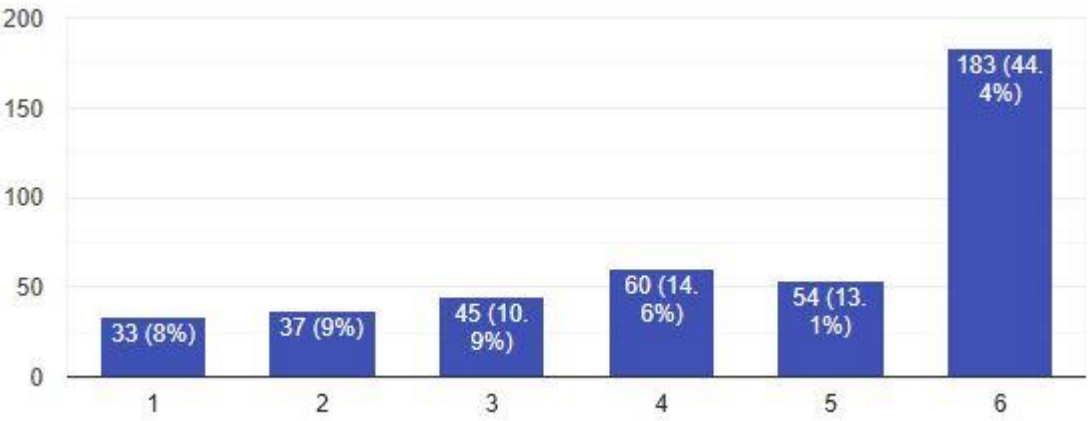


Figure 13: Results Variable Perceived Social Cost Question 2 "Our neighborhood is overcrowded with supermarkets" / (mean score = 4).

Figure 13 indicates that the majority of the respondents (44.4%) totally agreed that the neighborhood is overcrowded with current number of supermarket within their neighborhood. This result clearly indicates that the number of supermarkets surpassed what citizens perceive as being sufficient for their neighborhood. This result supports the negative perception of citizens towards the number of supermarkets on the island. It is suggested to consider this particular result, as the percentage of agreement stated in the results clearly indicates the disappointment of citizens towards the number of supermarkets on the island.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

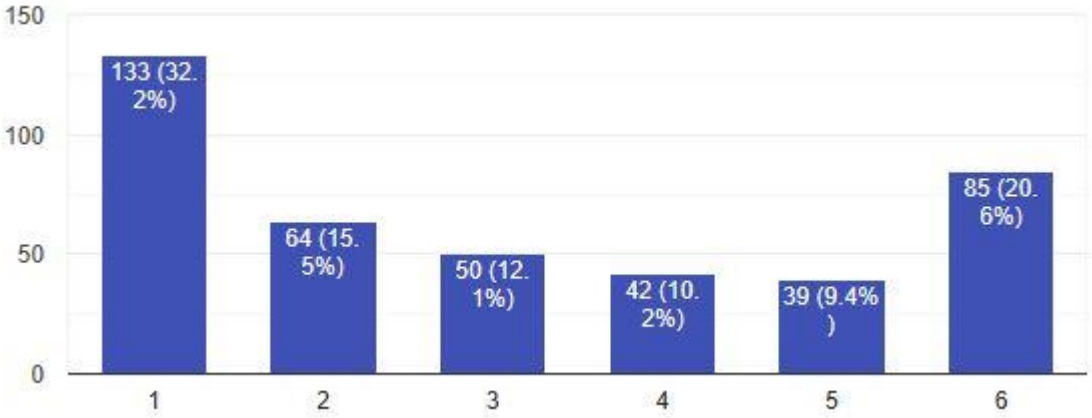


Figure 14: Results Variable Perceived Social Cost Question 3 "The amount of supermarkets is growing at an acceptable level in my neighborhood" / (mean score = 3).

Figure 14 indicates that the majority of the respondents (32.2%) totally disagreed with the statement related to the current growth rate of supermarkets on the island. Most find that it is at an unacceptable level and in combination with question 2 (Figure 13), it reinforces how citizens perceive the previous and current development related to these establishments.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

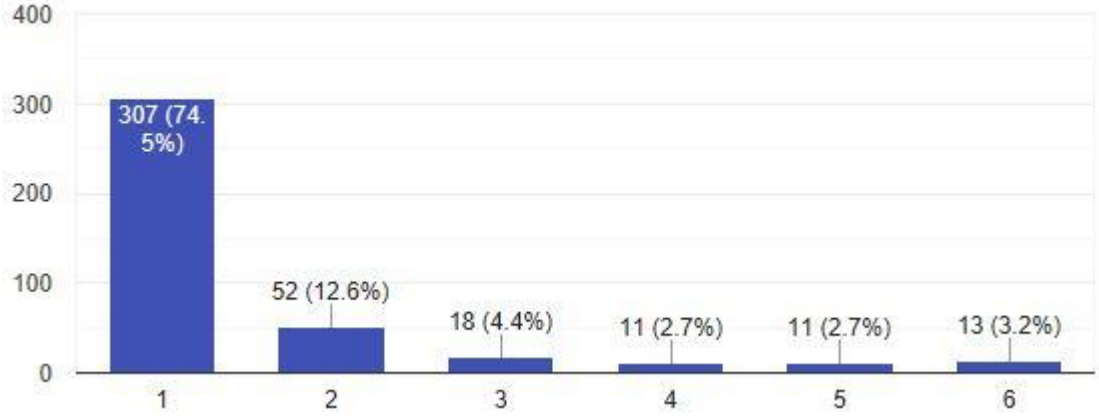


Figure 15: Results Variable Perceived Social Cost Question 4 "There is space for more development of supermarkets in my neighborhood" / (mean score = 2).

As it relates to "there is space for more development of supermarkets" (Figure 15), 74.5% of respondents totally disagreed with this statement. This percentage and in combination with the mean score of 2, clearly indicates that the citizens' negative attitude towards building additional supermarkets is very strong.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

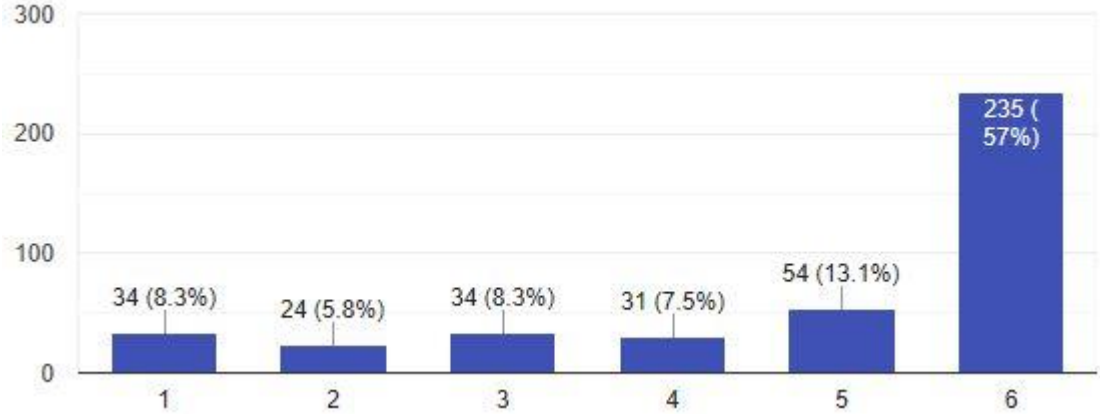


Figure 16: Results Variable Perceived Social Cost Question 5 "The supermarkets in my neighborhood do not generate jobs for our local community" / (mean score = 5).

Figure 16 indicates that the majority of the respondents (57%) totally agreed that the current supermarkets do not generate jobs for their local community. Additional to that, the results also provided a high mean score of 5 which clearly indicates that regardless of the potential economic contribution that supermarkets provide, locals don't perceive that they provide any positive social benefits, in terms of job creation, to their neighborhood.

Out of 5 questions under the variable "Perceived Social Cost", 4 questions provided clear indication that the citizens are not in sync with the previous and current development of supermarkets on the island.

The variable "**Environmental Sustainability**" consisted of 3 questions that were considered to provide an indication of the environmental factors associated with supermarket development on the island. Figures 17-19 illustrates the results obtained.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

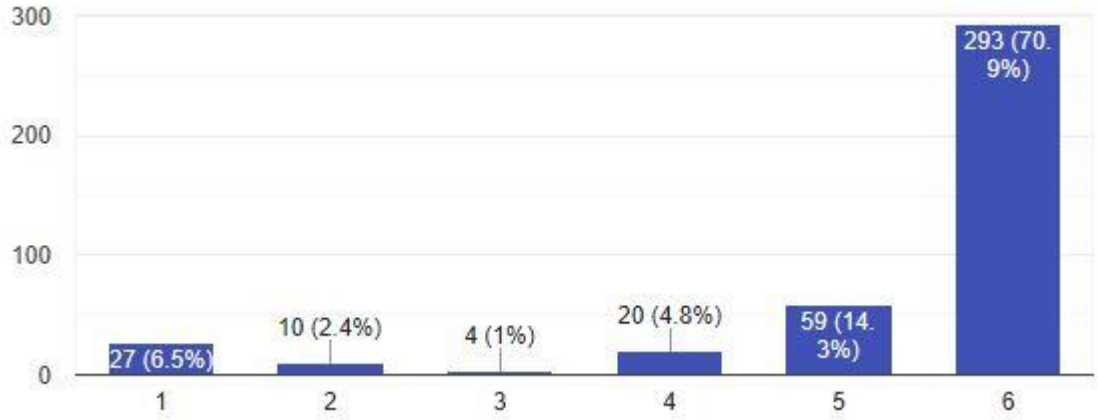


Figure 17: Results Variable Environmental Sustainability Question 6 "Adding more supermarkets does not improve our neighborhood's environment" / (mean score = 5).

Figure 17 indicates that the majority of the respondents (70.9 %) totally agreed that building additional supermarkets would jeopardize the environment. Similar to question 5, this result also provided a high mean score of 5 which also indicates that locals perceive adding more supermarkets will have a direct negative impact on the environment. Aruba has committed itself to the 2030 Agenda for Sustainable Development, and needs to consider eliminating these perceptions of locals of the current imbalance of supermarket development and the natural environment.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

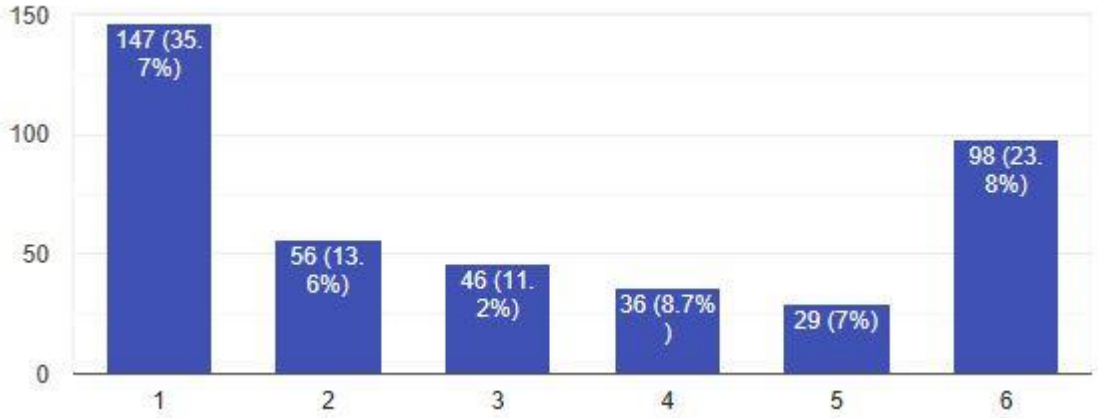


Figure 18: Results Variable Environmental Sustainability Question 7 "Supermarket development in our neighborhood takes the protection of the natural environment into account" / (mean score = 3).

Figure 18 also indicates that the majority of the respondents (35.7 %) totally disagreed that supermarket development goes hand in hand with the protection of the natural environment.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

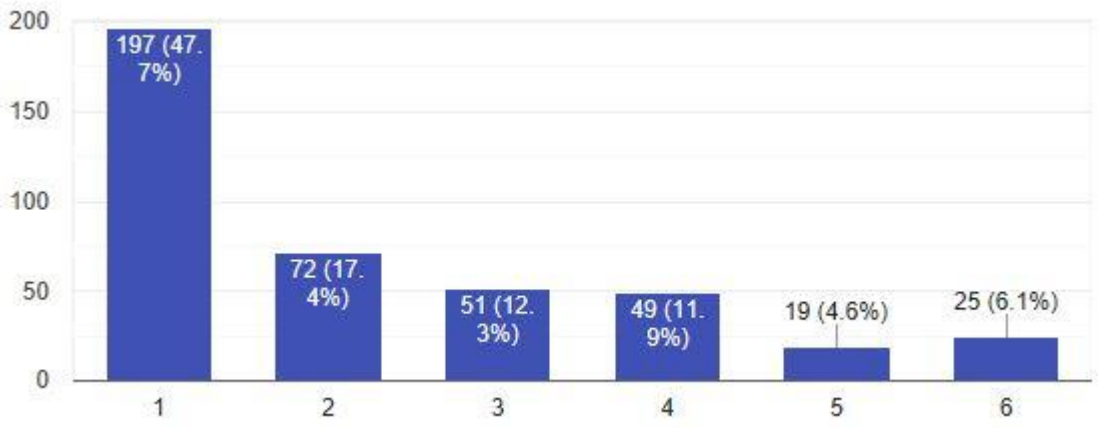


Figure 19: Results Variable Environmental Sustainability Question 8 "The supermarkets in our neighborhood were developed in harmony with the natural environment" / (mean score = 2).

Figure 19 also indicates that the majority of the respondents (74.7 %) totally disagreed that building additional supermarkets were developed in harmony with the natural environment. Similar to questions 6 and 7, this result provides additional arguments that locals perceive adding more supermarkets will have a negative impact on the local natural environment.

We can conclude that our locals do not perceive that supermarket development contributes to the local natural environment. All 3 questions under the variable "Environmental Sustainability" indicates how locals perceive the environmental impact of these types of development.

The variable "**Long Term Planning**" consisted of only 1 question that was considered to provide an indication of the planning behind supermarket development on the island. Figure 20 illustrates the results obtained.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

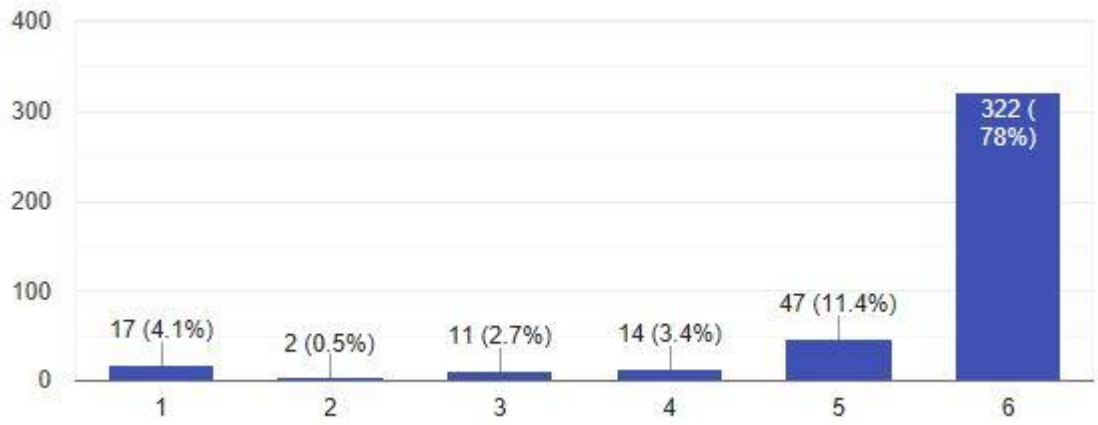


Figure 20: Results Variable Long Term Planning Question 9 "The placement of supermarkets needs well-coordinated planning" / (mean score = 6).

Results in Figure 20 indicates that the majority of the respondents (78 %) totally agreed that placement of supermarkets in a region needs well-coordinated planning (mean score of 6). This result can be interpreted that locals were never involved with any decision making process (for example at Town Hall Meetings) with the building of new supermarkets. Clearly, the respondents had a strong opinion about the planning of supermarket placement and have a strong desire to be involved in the process.

The variable "**Perceived Economic Benefit**" consisted of 2 questions that were considered to provide an indication of economic benefits associated with supermarket development on the island. Figures 21 and 22 illustrates the results obtained.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

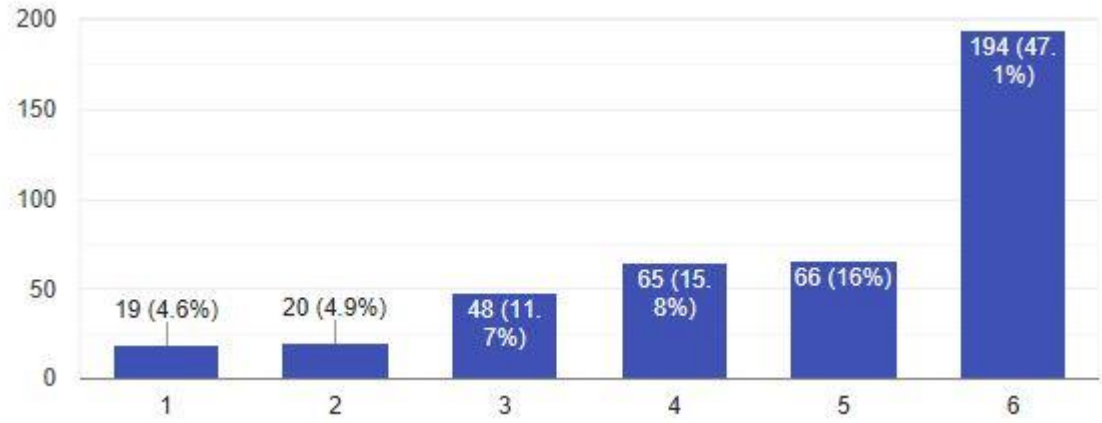


Figure 21: Results Variable Perceived Economic Benefit Question 10 "The current amount of supermarkets does not provide economic benefits to my neighborhood" / (mean score = 5).

Figure 21 illustrates that the majority of the respondents (47.1 %) totally agreed that the current amount of supermarkets does not provide any economic benefits to their neighborhood (mean score of 5). As no data were obtained to measure the total financial contribution per zones on the island, one cannot counter argue the perception of locals towards this phenomenon. However, since these questions are attitudinal in nature, one must still consider these results as being important for future data driven policy making.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

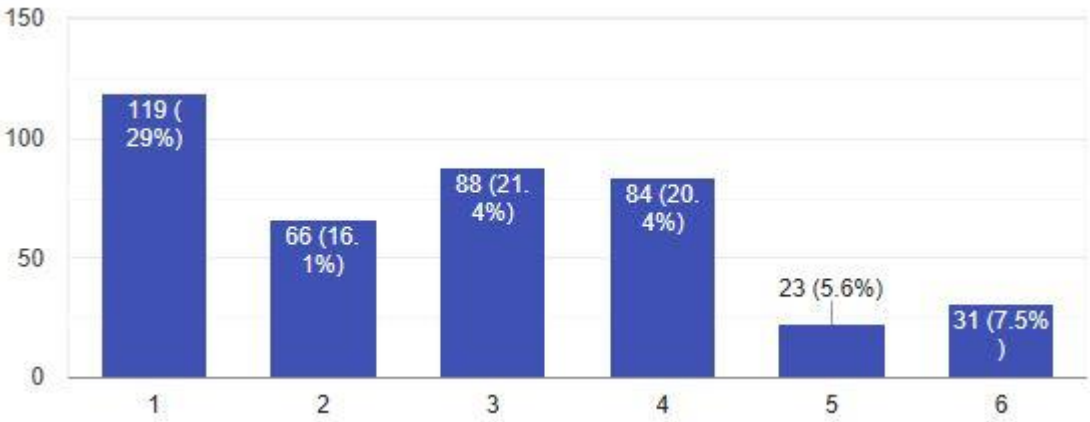


Figure 22: Results Variable Perceived Economic Benefit Question 11 "Supermarkets are beneficial for other businesses in the neighborhood" / (mean score = 3).

Results in Figure 22 indicates the majority of the respondents “totally disagreed” (29 %) that supermarkets are beneficial for other businesses in the neighborhood.

However, the above-illustrated results indicate that there is a mix of perception towards this statement. Results indicates that 21.4 % “somewhat disagreed” and 20.4 % “somewhat agreed” with the statement. Both results provides an indication that supermarket development did not provide any economic benefit for their neighborhood. Neither in terms the local economy in general nor their neighborhood. Additional data needs to be obtained to provide a clear indication of the total economic benefit per region. However, the perceptions by local citizens remains a pessimistic one.

The variable “**Neighborhood Centered Economy**” consisted of 2 questions that explained social related factors associated with supermarket development in each neighborhood. Figure 23 and 24 illustrates the results obtained.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

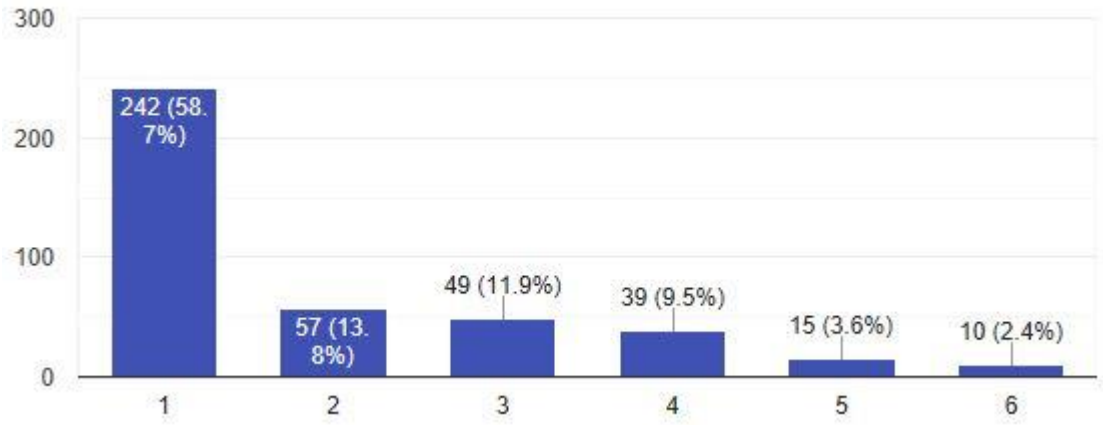


Figure 23: Results Variable Neighborhood Centered Economy Question 12 "Supermarkets hire most of their employees from within our neighborhood” / (mean score = 2).

Figure 23 indicates that the majority of the respondents (58.7 %) totally disagreed that supermarkets hire most of their employees from within their neighborhood. This result raises the question and concern about the type of employment that these supermarkets provide. Are there any formal, informal or even illegal practices in place, and if any, how can this be addressed and corrected. Further investigation is therefore suggested.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

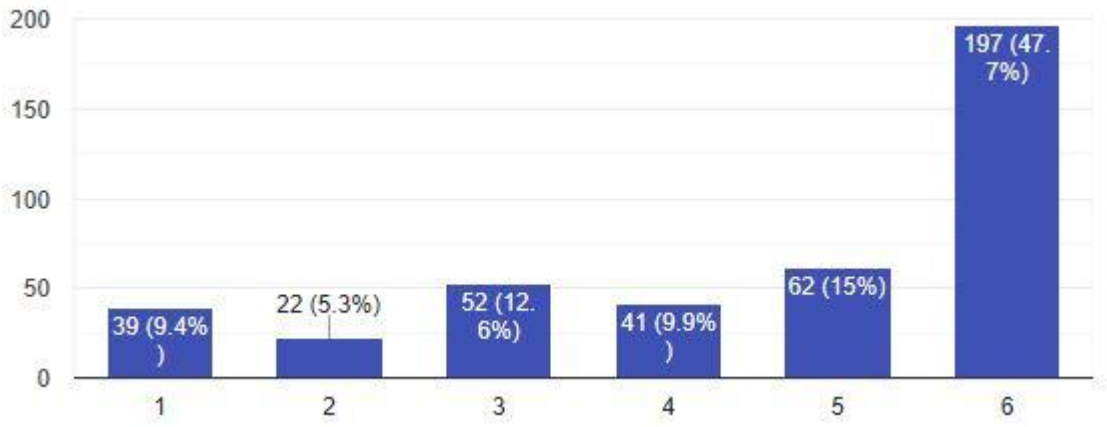


Figure 24: Results Variable Neighborhood Centered Economy Question 13 "Supermarkets businesses in my neighborhood does not contribute socially to a neighborhood's improvement" / (mean score = 5).

Figure 24 indicates that the majority of the respondents (47.7 %) totally agreed that supermarkets do not contribute socially to their neighborhoods. In combination with question 12, it is suggested to further investigate this matter in order to provide a clear indication of the labor practices in our local supermarkets.

Both questions 12 and 13 provided an indication of how locals perceived supermarket development and its contribution to their neighborhood. As suggested before, this study suggest a separate investigation for further analyze what the current labor practices are at each one of these supermarket.

The variable "**Ensuring Client Satisfaction**" consisted of 6 questions that were considered to explain the level of quality of the current supermarkets on the island. Figures 25-30 illustrates the results obtained.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

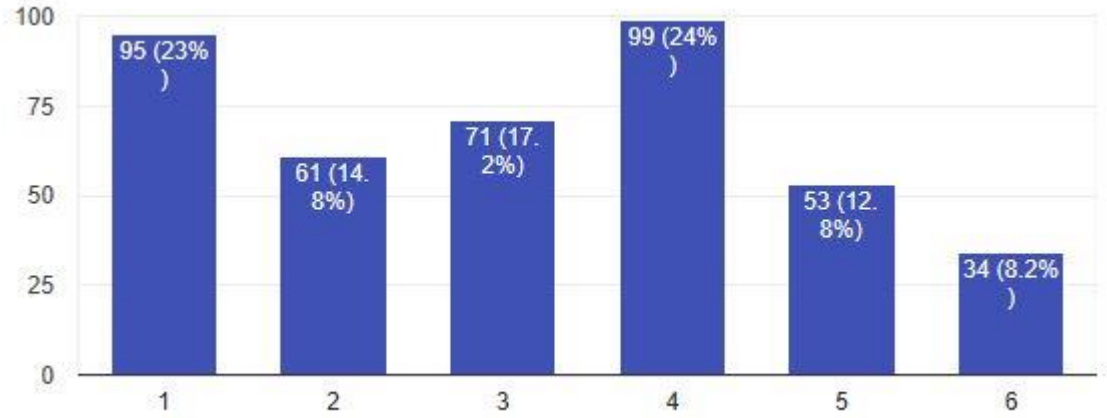


Figure 25: Results Variable Ensuring Client Satisfaction Question 14 "I am satisfied with the quality of the current supermarkets in my neighborhood" / (mean score = 3).

Results in Figure 25 indicates the majority of the respondents “somewhat agree” (24 %) that locals are satisfied with the quality of the current supermarkets in their neighborhood. However, the above-illustrated results indicate that there is a mix of perception towards this statement. Results indicates that 23 % “totally disagree” and 17 % “somewhat disagree” with the statement.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

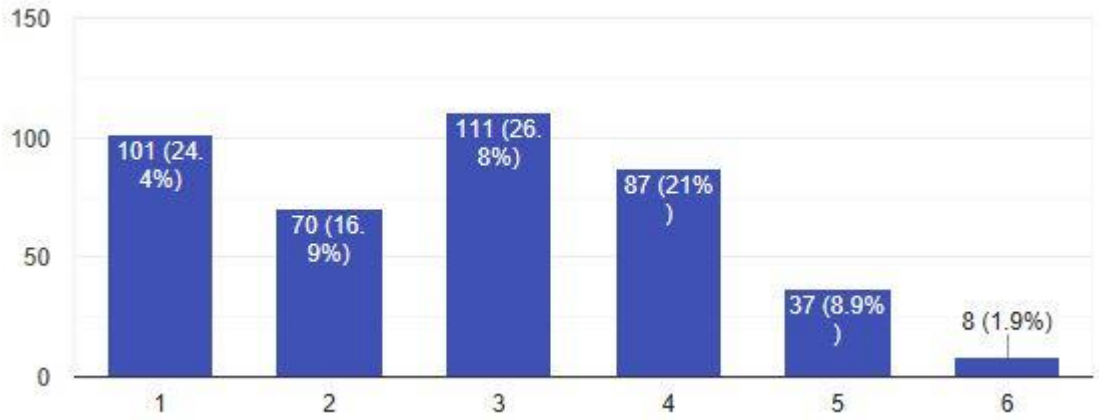


Figure 26: Results Variable Ensuring Client Satisfaction Question 15 "The supermarkets on the island provide quality client experience / (mean score = 3).

Results in Figure 26 indicated that the majority of the respondents (26.8 %) somewhat disagreed that the supermarkets provide quality client experience. However, the results are relatively close to each other with 24 % of the responded stating that they totally disagreed and 21% with somewhat agreed. To offset the negative perception from local citizens towards the supermarkets, it is essential that supermarket operators provide quality experience to their clients in order to remain competitive within this sector.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

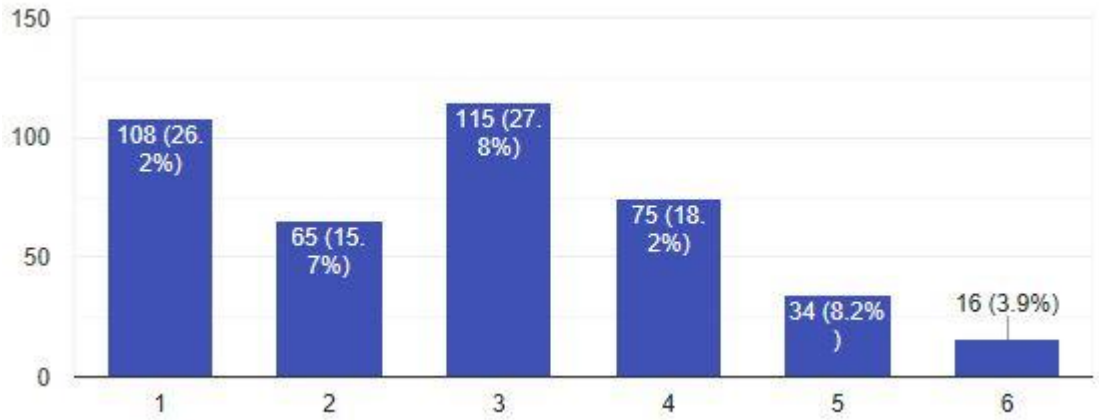


Figure 27: Results Variable Ensuring Client Satisfaction Question 16 "The supermarkets in my neighborhood are attractive to visit” / (mean score = 3).

Figure 27 illustrates the outcome on the attractiveness of supermarkets in the respondents' neighborhood. Here we have again a close percentage outcome between "Somewhat disagree" (27.8%) and "Totally disagree" (26.2%), a 1.6 % difference between the two options. In general, one may conclude that the majority of the respondents perceive the current supermarket of being unattractive to visit in their neighborhood.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

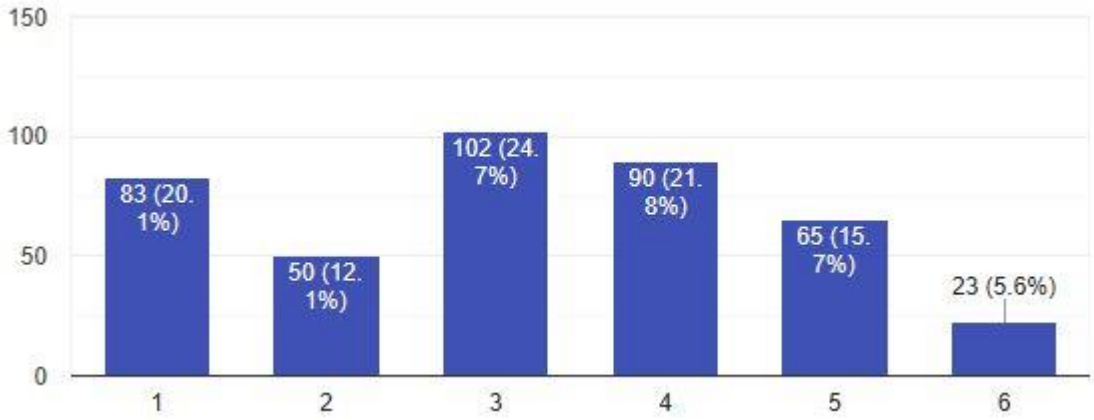


Figure 28: Results Variable Ensuring Client Satisfaction Question 17 "In general, supermarkets are properly maintained on the outside (cleaned, painted etc.)" / (mean score = 3).

Results on Figure 28 indicates that the majority of respondents (24.7%) "Somewhat disagreed" that the supermarkets on the island are properly maintained on the outside. This result is another indication of a slightly mixed perception on how respondents view the overall quality of the current supermarkets.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

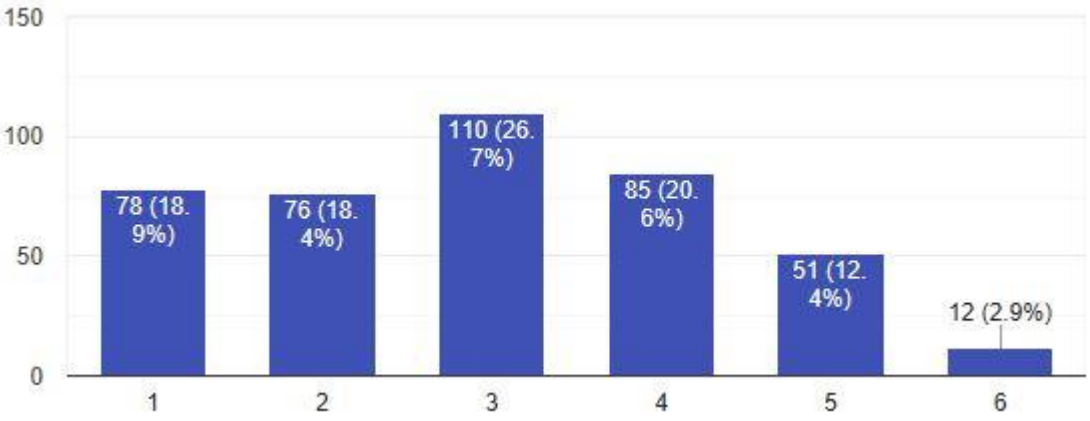


Figure 29: Results Variable Ensuring Client Satisfaction Question 18 "In general, supermarkets are properly maintained on the inside (cleaned, painted etc.)" / (mean score = 3).

Results on Figure 29 indicates that the majority of respondents (26.7%) somewhat disagreed on the statement that the supermarkets on the island are properly maintained on the inside of the supermarket establishment. Similar to the results of question 17, it provides another indication of a slightly mixed perception on how respondents view the overall quality of the current supermarkets.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

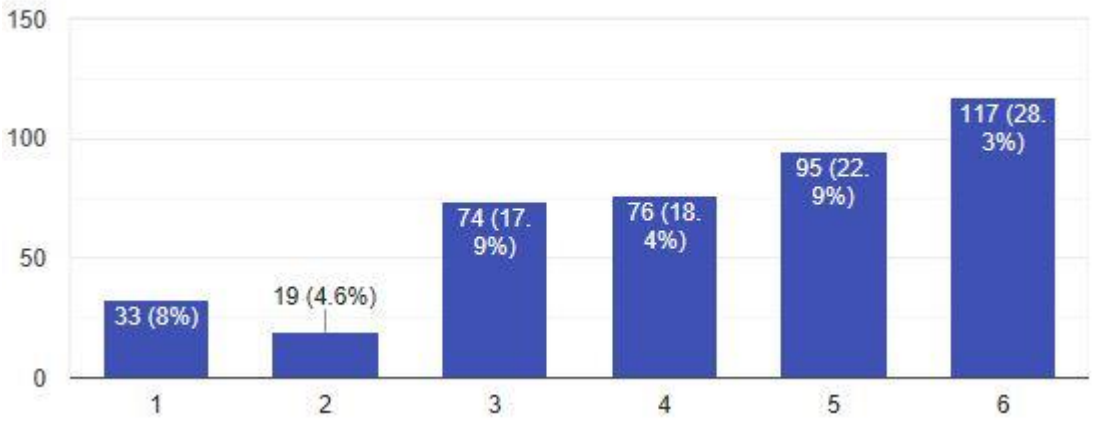


Figure 30: Results Variable Ensuring Client Satisfaction Question 19 "The fact that I have easily access to a supermarket in my neighborhood is important for my living conditions" / (mean score = 4).

The majority of respondents (28.3%) totally agreed that easy access to a supermarket in their neighborhood is important for their living conditions. The above-mentioned results may be considered conflicting to some of the previous results pertaining "Perceived Social Cost".

The overall results were mixed, except for question 19, which is related to the accessibility of supermarkets in their neighborhood. Though the average response to client satisfaction indicates that respondents are only slightly dissatisfied, it may be the case that in some area respondents are more dissatisfied then others. The implicit assumption is that respondents tend to do groceries more frequently at a supermarket in their zone.

Zones like "Standard Ville", "Macuarima", and "Pos Chiquito" host the most satisfied respondents. On the other hand, zones like "San Nicolas Zuid", "Lago/Esso Heights", and "Eagle/Paardenbaai" host the least satisfied respondents. The number of respondents that live in "Standard Ville" is only two. The same is true for the number of respondents that live in "San Nicolas Zuid". Thus, the mean satisfaction score may not be representative of these zones. In fact, many of the zones have few respondents.

We approach the low response per zone issue by reclassifying the respondents by district. This is a reasonable approach as there is not a physical supermarket present in every zone, thus district may be more representative. For example, there are no supermarkets established in "Juwana Morto", so respondents from this zone are more likely to do grocery shopping at "Lago/Esso Heights", "Essoville", or some other zone within San Nicolas.

In Table 11, the satisfaction category has been reclassified according to the district of respondents' residency. We can see that the Region Noord/-Tanki Leendert and Oranjestad were (relatively) well represented in the survey with both having over a hundred respondents. The Regions Paradera and Santa Cruz were less well represented with only half the response rate. Finally, Region San Nicolas and Savaneta were barely represented with only around twenty (20) respondents each. Overall, all Zones exhibit a mean close to three (3) or "Slightly Disagree".

Table 11: Mean Satisfaction Score per Region on "Ensuring Quality Satisfaction".

Region	Mean Satisfaction	Count
Noord	3.12	103
Savaneta	2.99	22
San Nicolas	2.98	26
Santa Cruz	2.96	58
Paradera	2.89	62
Oranjestad	2.79	107

The variable "**Maximizing Neighborhood Participation**" consisted only 1 question which was considered to provide an indication of the participation of citizens in an economic development within their neighborhood. Figure 31 the results obtained.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

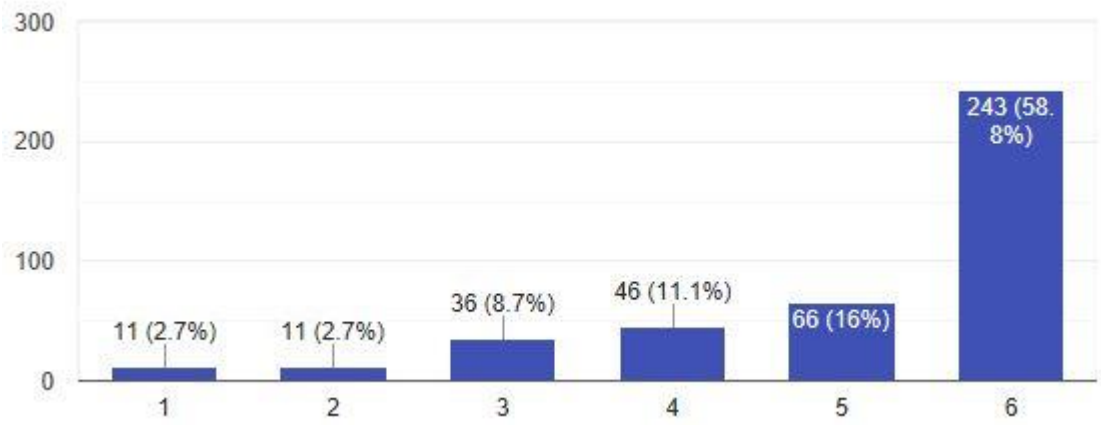


Figure 31: Results Variable Maximizing Neighborhood Participation Question 20 "Citizens must be involved when planning for a new supermarket in their neighborhood" / (mean score = 5).

Figure 31 provides interesting results, as locals perceive that they are not involved with any economic developments in their neighborhood, and the results clearly illustrates the lack thereof in terms of supermarket development/growth. A total of 58.8% totally agreed that they must be involved when planning for a new supermarket in their neighborhood.

The variable "**Quality of Life**" consisted of 6 questions that were considered to provide an indication of the quality of life of residents associated with supermarket development in their neighborhood. Figure 32- illustrates the results obtained.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

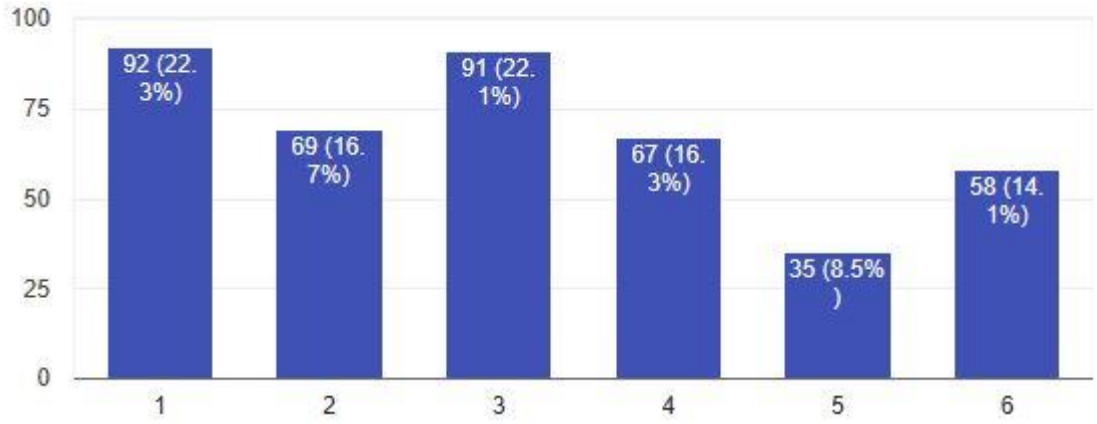


Figure 32: Results Variable Quality of Life Question 21 "The amount of supermarkets create noise in my neighborhood" / (mean score = 3).

As it relates to the potential noise caused by established supermarkets, majority of the respondents disagreed with this statement, with 22.3% of the respondents totally disagreeing and 22.1% somewhat disagreeing with the statement related to noise pollution caused by established properties. This shed some positive light to the recently growth of supermarkets, as one could easily assume the direct positive correlation between supermarket growth and noise pollution. The results are contrary to our neighbor island Curaçao, where noise pollution and traffic congestions were the main reasons for their current moratorium.[7]

[7] Interview with Mr. Louelo Girigorie, Director "Ministerie Economische Ontwikkeling Curaçao..

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

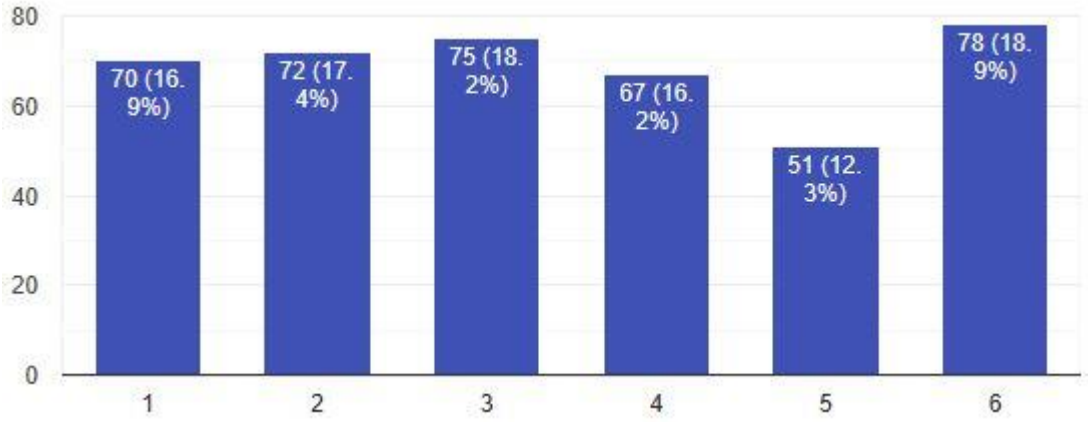


Figure 33: Results Variable Quality of Life Question 22 "The current supermarkets creates traffic inconvenience (not enough parking spaces or traffic congestion) in my neighborhood" / (mean score = 3).

Even though the majority of the respondents (18.9%) totally agreed with the statement referring to traffic congestions caused by established supermarkets. It is not the traditional way of describing such results, but if summed, Figure 33 provides a complete mixed perception towards this statement, with the majority of respondents (52.5%) falling in the "Disagree" section of the Likert scale.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

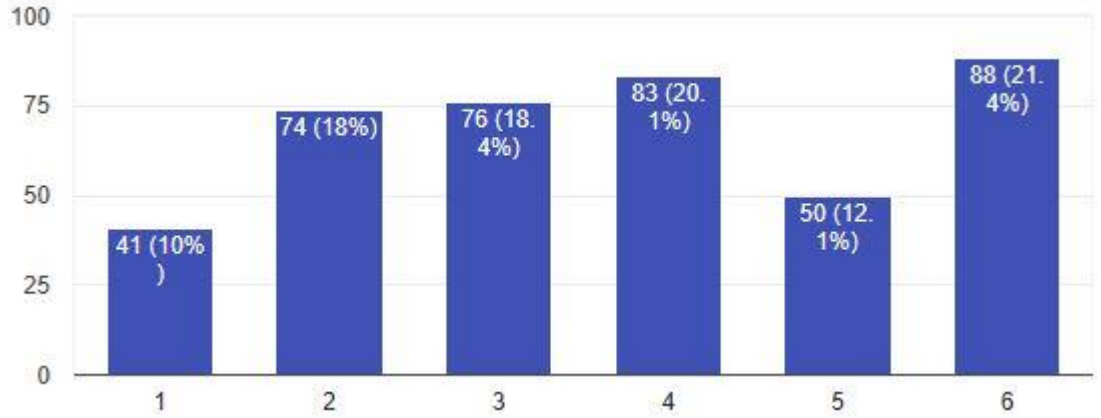


Figure 34: Results Variable Quality of Life Question 23 "The amount of supermarkets create pollution (empty boxes, empty beer bottles, undesirable animals etc.) in my neighborhood" / (mean score = 4).

Figure 34 results illustrated that the majority of respondents (21.4%) total agreed with the pollution caused by established supermarkets. This coincides with the variables Perceived Social Cost (Question 2-Our neighborhood is overcrowded with supermarkets 44.4% "Totally Agreed") and Environmental Sustainability (Question 6-Adding more supermarkets does not approve our neighborhood's environment/70.9% "Totally Agreed").

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

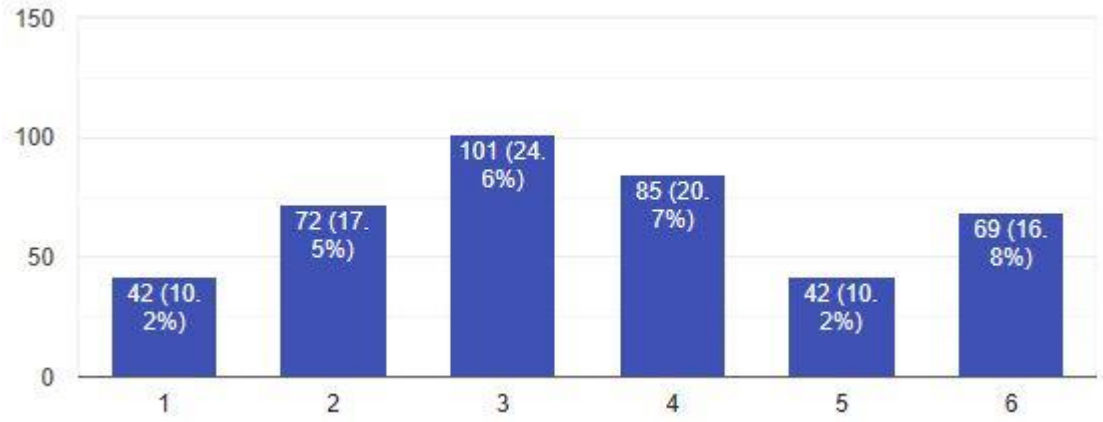


Figure 35: Results Variable Quality of Life Question 24 "The supermarkets in my neighborhood reduce the financial value on the properties around it" / (mean score = 4).

Most respondents (24.6%) somewhat disagreed that supermarkets reduced the financial value of the properties in their neighborhood. The economic impact of the increase pressure of "out of center" supermarket development has not been estimated yet, but to estimate the exact financial impact on the nearby properties can be a tedious undertaking. At least, this result does not provide an alarming concern for policy makers.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

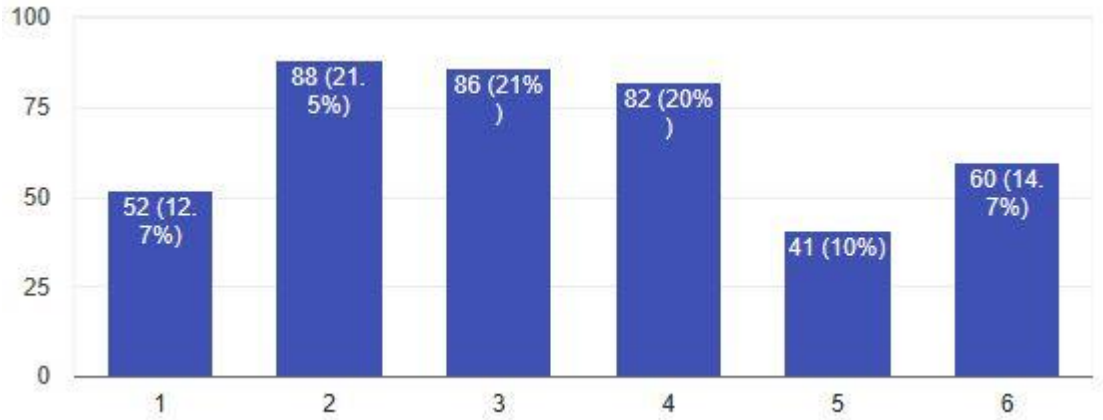


Figure 36: Results Variable Quality of Life Question 25 "The amount of supermarkets create unsafe environment (illegal activities-theft, drugs, crime etc.) in my neighborhood" / (mean score = 3).

Figure 36 results illustrated mix of results, while most respondents (21.5) had indicated their disagreement with the unsafe environment with the amount of supermarkets on the island. This result came to a surprise, as there was a track record of several robberies linked to supermarkets in the past.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree

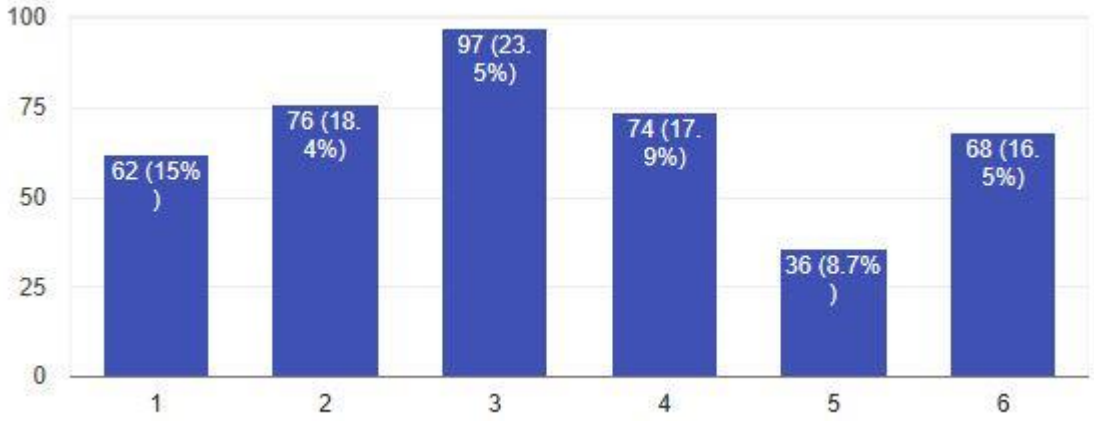


Figure 37: Results Variable Quality of Life Question 26 "The amount of supermarkets create undesirable "smell" (old trash, smoke etc.) in my neighborhood" / (mean score = 3).

Figure 37 indicates that the majority of respondents (23.5%) indicated that there is no relationship to supermarket developments and undesirable smells produced by a supermarket establishment. This also coincides with previous question 23 where most respondents disagreed on the statement of pollution caused by supermarket development.

Overall, "Quality of Life" respondents provided a series of mixed results on their overall perception of the negative impact of supermarket development on their quality of life. Similar to the variable "Ensuring Client Satisfaction", we aggregated responses of the variable "Quality of Life" by their Zones. The mean score for "Quality of Life" per Zone in Table 12 is even closer to the median response 3.5 (neutral) as compared to the variable "Ensuring Client Satisfaction". The lowest scoring Region in this category is San Nicolas with a mean score of 3.01 equivalent to "Slightly Disagree". The questions in this category all ask whether supermarkets have a detrimental (negative) impact on the "Quality of Life". Therefore, we may conclude that respondents do not feel that supermarkets have any negative impact on their "Quality of Life". In fact, respondents from San Nicolas slightly disagreed with these statements. However, the response rate for San Nicolas is only 26.

Table 12: Mean Scores Quality of Life.

Region	Mean Satisfaction	Count
Oranjestad	3.73	107
Savaneta	3.63	22
Noord	3.39	103
Santa Cruz	3.36	58
Paradera	3.2	62
San Nicolas	3.01	26

The following results were derived from questions pertaining the shopping characteristics of the respondents, including the number of times visiting a supermarket, the reasons for the choice of shopping in the same or in different neighborhoods. The following figure (Figure 38) illustrates the number of times respondents visit a supermarket. The

majority of respondents (34.1%) indicated that they visit a supermarket 2-3 times per week, with the second group (18.2%) indicated a 3-4 times per week visit pattern. It is difficult to draw conclusion from this one question, but it can considered as one of the reasons why we have an exponential growth of supermarkets on the island.

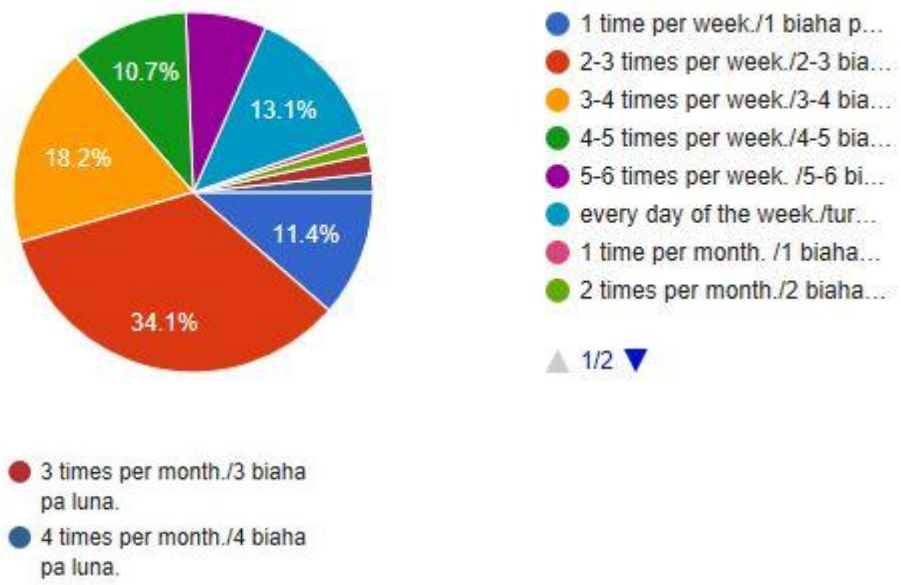


Figure 38: Figure 38: Results Question 27 "How many times do you visit a supermarket".

Figure 39 illustrates the choice of location when going to a supermarket, being in either the "same" neighborhood or a different one. Majority of the respondents (51.4%) mentioned that they "sometimes" go to the same supermarket in their neighborhood, while 24.4% mentioned that they do not visit the same supermarket in their neighborhood and 23.4 % mentioned that they do.

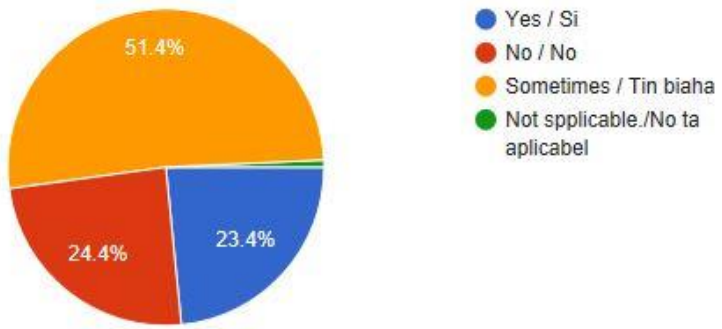


Figure 39: Results Question 28 "For your grocery shopping, do you go to a supermarket that is in the same neighborhood that you live in?

Figure 40 illustrates the reason(s) respondents visit a supermarket in the same neighborhood they live at. Most of the criteria were chosen from the yearly "Food shopping behavior in the U.S." conducted by the Statista [8]. The majority of the respondents (74.5%) chose "convenient location" as their main reason for doing so. Store hygiene (21.8%) was the second most important reason for going to a supermarket in the same neighborhood. Important to note here is the outcome of question 18 (Supermarkets are properly maintained on the inside) that the majority of the respondents (26.7%) indicated that supermarkets are not properly maintained on the inside. Even though the question did not specify hygiene standards, it is important that operators use this outcome as an indication on the importance of the overall cleanliness of their operation.

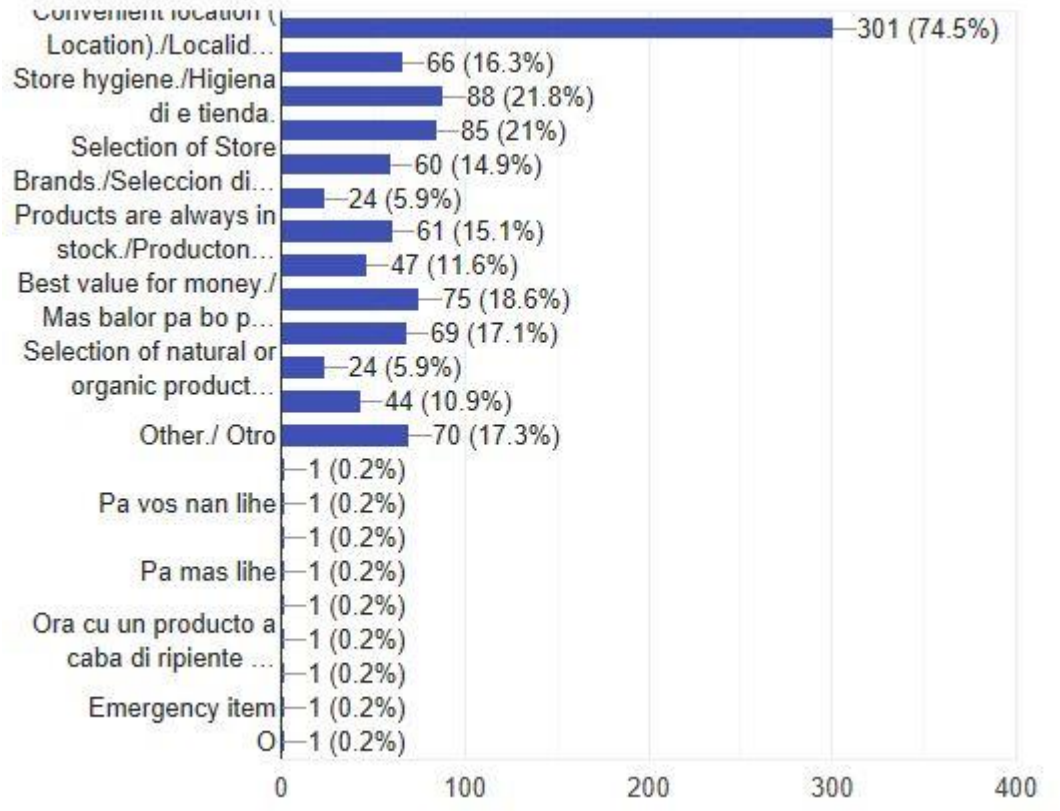


Figure 40: Results Question 28a "The reason(s) for going to a supermarket in your neighborhood is because of".

Figure 41 illustrates the choice of location when going to a supermarket, being in either the "different/other" neighborhood. Majority of the respondents (57.6%) mentioned that they "do" go to a supermarket in a different neighborhood, while 38 % mentioned that they "sometimes" visit a supermarket in a different neighborhood.

[8] https://www.statista.com/statistics/493800/factors-considered-by-us-consumers-in-choosing-stores-for-grocery-shopping/

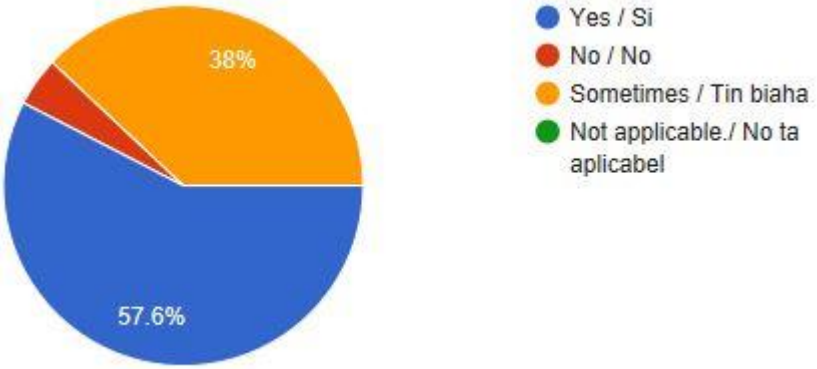


Figure 41: Results Question 29 "For your grocery shopping, do you go to a supermarket that is in a different/other neighborhood than that you live in?

Figure 42 illustrates the reason(s) respondents visit a supermarket in a "different" neighborhood than where they live at, where the majority of the respondents (56.9%) chose "selection of store brands" as their main reason for doing so. "Best Value for Money" (52.5%) was the second most important reason for going to a supermarket in a different neighborhood. "Store Hygiene" (50.7%) resulted again as an important factor and is therefore suggested again that operators use this outcome as an indication on the importance of the overall cleanliness of their operation.

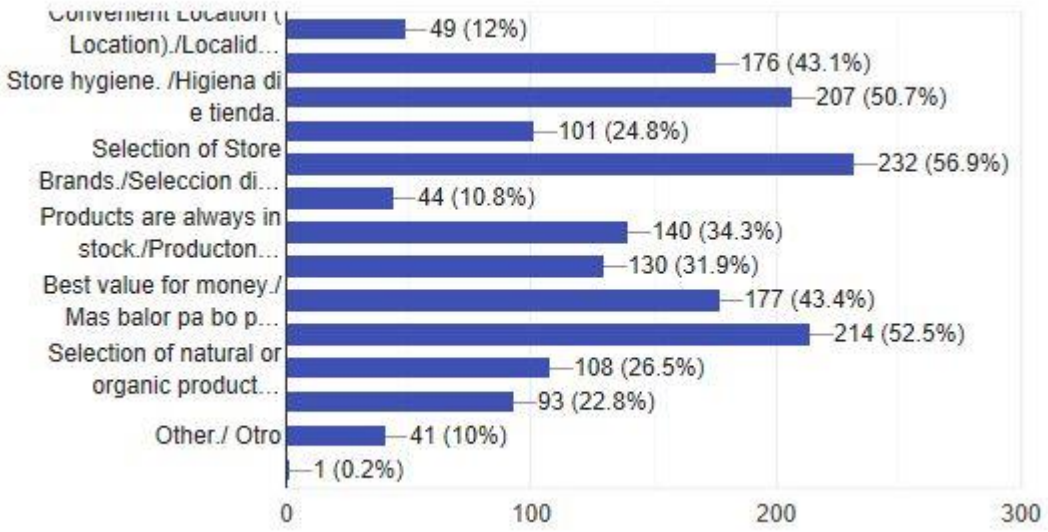


Figure 42: Results Question 29a "The reason(s) for going to a supermarket in a different neighborhood is because of".

Related to Question 29 (Do you go to a supermarket that is in a different/other neighborhood than that you live in), an additional question was added to the survey asking for the "other" area(s) where respondents do their groceries. Table 13 illustrates the results of question 29. "Noord" (31.7%) resulted the most visited area respondents visit other than their own neighborhood, with "Eagle/Paardenbaai" (12.6%) being the second most visited, followed by "Pos Abou/Cunucu Abou" (9.7%) and "Palm Beach/Malmok" (7.9%). The four above-mentioned areas all fall under the Region "Noord" (and "Oranjestad-West", which are areas that have the three largest supermarkets on the island (Superfood, Save-A-Lot, Ling and Sons, Kong Hing Supermarket).

Table 13: Number of Respondents that visit a Supermarket other than their own neighborhood.

Zones	# respondents	Zones	# respondents
Alto Vista	3	Paradijs/Santa Helena	5
Ayo	1	Paredera overig	1
Brasil	4	Pastoor Hendrikstraat	2
Companashi/Solito	1	Piedra Plat	4
Dakota/Portero	12	Pos Abou/Cunucu Abou	37
Eagle/Paardenbaai	48	Pos Chikito	5
Essoville	4	Rooi Congo	1
Hooiberg	2	Sabana Blanco/Mahuma	7
Klip/Mon Plaisir	1	San Nicolas Noord overig	6
Kustbatterij	1	San Nicolas Zuid overig	2
Macuarima	1	Santa Cruz overig	6
Madiki Kavel	1	Savaneta overig	3
Madiki/Rancho	2	Sero Blanco/Cumana	4
Moco/Tanki Flip	4	Sividivi	2
Nassaustraat	1	Socotorro/Rancho	1
Noord overig	121	Tanki Leendert	4
Oranjestad Oost overig	25	Tarabana	1
Palm Beach/Malmok	30	Washington	10
Papilon	1	Watapana Gezag	2
Paradera	16	TOTAL RESPONDENTS	382

The following question was included in the survey as non-supermarket retail operators expressed several concerns about lack of strict guidelines that ensures a balance of the supply of products between different branches[9]. The majority of respondents chose "Other" (47.9%) with "Electronics" (24.4%) being the second largest choice, followed by "Auto Parts" (22.8%). Other areas of concern are "Toys" (21%), Clothes (16.2%) and "Outdoor Recreation Supplies" (12.8%). Please refer to Table 28 for the detail of the results.

[9] Moratorium Studie Aruba, 2007, Afdeling Vestiging Bedrijven, Directie Economische Zaken, Handel en Industrie, p.3.

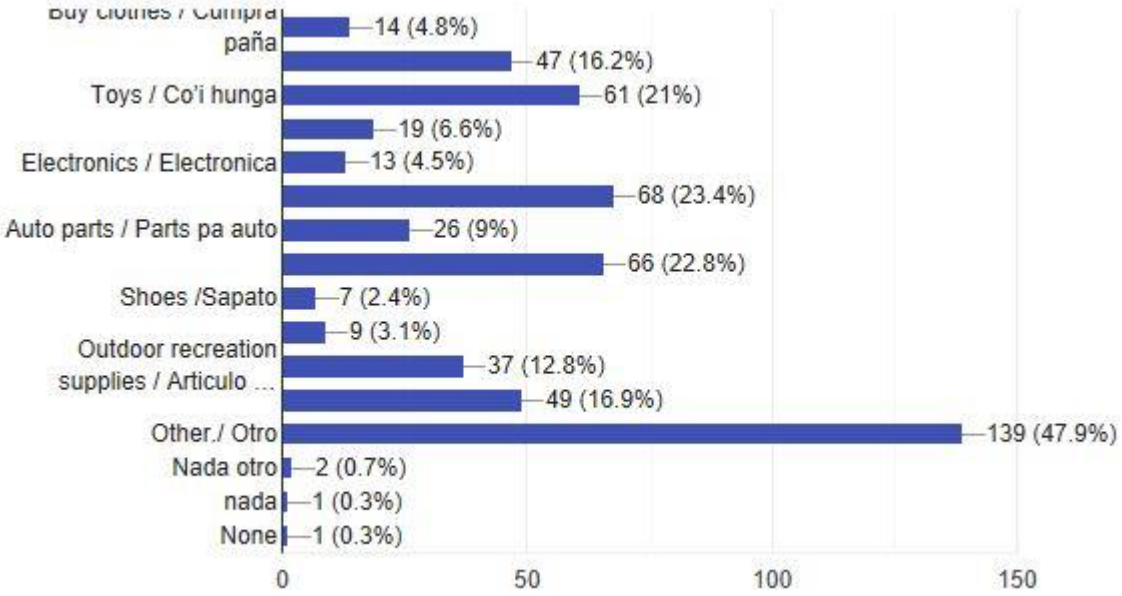


Figure 43: Results Question 30 "Aside from "regular" grocery shopping, what other items do you purchase during your visit to a supermarket?

As it relates to the demographics of the respondents, 71.5% of the respondents were females and 27.8% males (Figure 44). In terms of their marital status, 49.8% were married, 41.1% were single and 9.2% divorced (Figure 18).

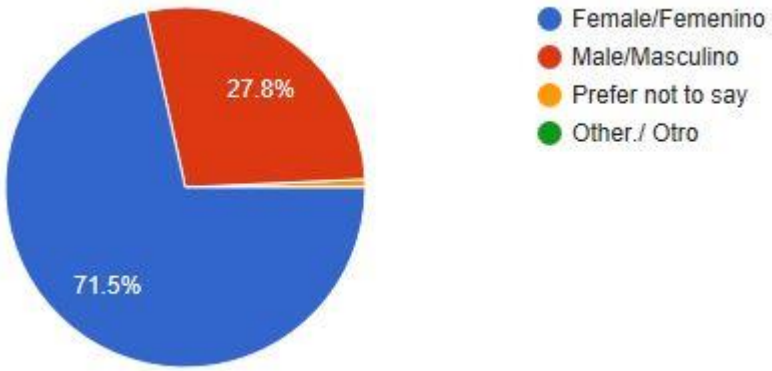


Figure 44: Results Question 31 "Gender".

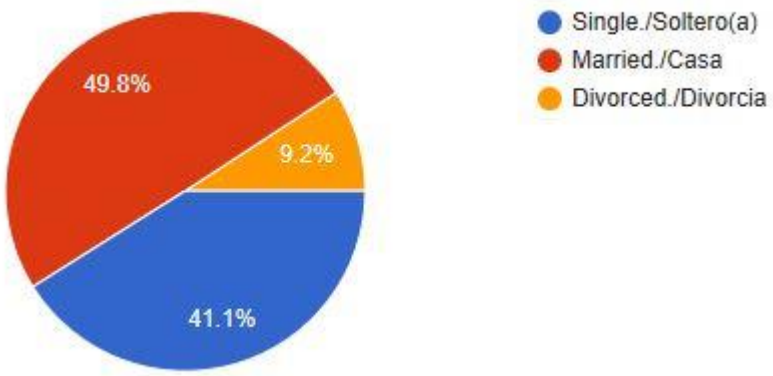


Figure 45: Results Question 32 "Marital Status".

In terms of “Educational Background”, 29.7% had primary education, 15.1% had MAVO diploma, 14.8% VWO diploma, and 11.2% Colegio EPI. Majority of the respondents were Arubans (79%), 13.8% were between 45-49 years old, 13.3% between 40-44 years old, 12.3% between 50-54 years old and 11.9% between 30-34 years old.

Results Phase IV: Market structure analysis

This section reports the results of the market structure analysis, which consists of three elements, as defined in Section 2 Methodology. First, we discuss the composition of the supermarket industry. Second, we analyze the price developments in recent years. Lastly, we look at the industry growth rate.

Market composition.

For the supermarket industry on Aruba, the Herfindahl-Hirschman Index (HHI) is equal to 894 for the year 2017. The HHI does not vary much over the sample period of 2013 to 2017, with the exception of 2016 where the HHI is equal to 1,000. From 2015 to 2016 the HHI for the supermarket industry increased by 122 points, indicating an increase of market concentration. However, the index quickly falls back to 894 the following year in 2017. Table 14 below provides an overview of the computed HHI on the supermarket industry over the sample period.

Table 14: Overview Herfindahl-Hirschman Index (HHI).

year	HHI
2013	814
2014	850
2015	878
2016	1,000
2017	894

Source: Central Bureau of Statistics Aruba; Food and Agriculture Organization of the United Nations; and Federal Reserve Bank of St. Louis.

Price Developments.

Over the sample period 2008 to 2018, the Consumer Price Index (CPI) of local food was volatile. From year-end to year-end, the change in CPI of local food ranges from as much as 12.7 percent to minus 1.8 percent. The mean for the CPI of local food was equal to 2.48 percent with a median of 0.2 or close to zero. Thus, the change in CPI for local food was not stationary, but exhibited a positive upward trend over the sample period. This positive trend is illustrated in Figure 46.

The average annual increase in the price food and non-alcoholic beverages over the sample period is equal to 2.48 percent. The average change in the price of the consumer price index over the same period is 0.76 percent per annum. In other words, the price of food and non-alcoholic beverages is increasing more than three times faster than the weighted average price of all goods and services.

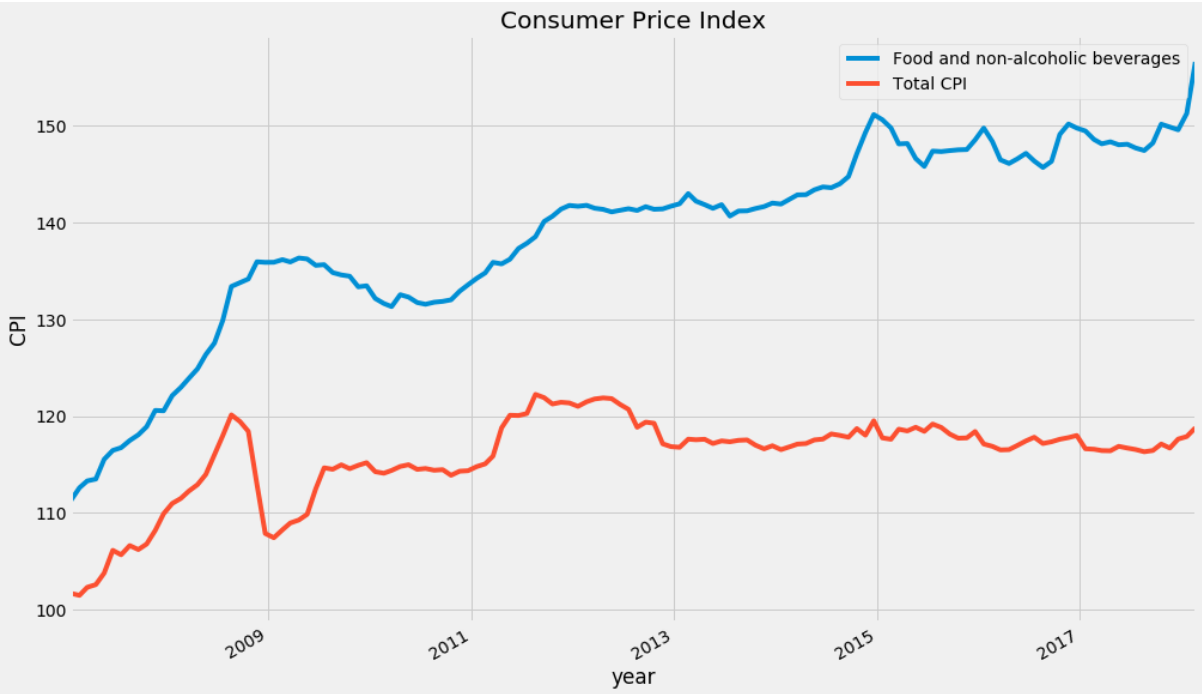


Figure 46: The Price of Food and the Consumer Price Index (Source: Central Bureau of Statistics, 2018).

The global CPI of food had a mean of -0.47 percent and a median of -2.5. With a mean close to zero, the changes in global food price was more balanced over the sample period as compared to the local price of food. If we look at the mean and median of all three variables, over a monthly frequency and over a longer sample period, we found that both the mean and median were very close to zero. Thus, changes in both the global and local price of food is "mean reverting"[10] over a longer period.

[10] https://www.investopedia.com/terms/m/meanreversion.asp (Mean reversion is financial theory suggesting that asset prices and returns eventually return back to the long-run mean or average of the entire dataset. This mean or average can be the historical average of the price or return, or another relevant average such as the growth in the economy or the average return of an industry.)

The figure above (Figure 19) shows a deviation from the Total CPI occurring from 2013 onward. The correlation between the change in local CPI food and global CPI food is a weak correlation of .17. The same is true for the correlation between the change in CPI food and crude oil, with a coefficient of 0.02. On the other hand, the correlation between Global CPI food and crude is moderate at 0.58. This makes sense as crude oil is used in the production of some foods but also in the transportation of most food products. Table 44 provides an overview of changes in price of food in the local and the global market, as well as price of crude. The prices reflected in this table are the year-end prices.

Table 15: Average Change local food index, global food index, and global crude index.

date	local food	global food	global crude
12/31/2013	142.00	206.20	98.17
12/31/2014	151.14	185.80	53.45
12/31/2015	148.53	153.40	37.13
12/31/2016	149.75	170.30	53.75
12/31/2017	149.57	169.10	60.46
Average Rate of Change in %	1.35	-4.25	-4.71

Source: Central Bureau of Statistics Aruba; Food and Agriculture Organization of the United Nations; and Federal Reserve Bank of St. Louis.

Comparing the rate of change of the local food index to the rate of change of the global food index and global crude index, we see a significant difference. The price of food and crude on the global market has been decreasing at an average rate of 4.25 and 4.71 percent per annum, respectively. On the other hand, the price of the local food index has been steadily increasing at an average rate of 1.35 percent per year.

Industry growth rate

Over the sample period 2013 to 2017, the number of employment within the supermarket industry ranged from as low as 1,304 to as high as 1,701. The average number of employment of this period was equal to 1,407, with a median of 1,370.

The population data, over the same sample period, exhibits a minimum of a 105 thousand and a maximum of 111 thousand. The population data had a mean of 108 thousand, and a median of 109 thousand.

In the case of the supermarket population, the mean is higher than the median, suggesting rapid growth over time. On the other hand, the mean of the total population is less than the median, hinting at slower growth over time. There is a strong correlation between the population size and the number of employed within the supermarket industry, suggesting that the population size is a main driver of employment for this industry. This made sense, as the population of the supermarket employees is dependent on the size of the total population.

Figure 47 below provides an overview of the number of individuals employed within the supermarket industry against the total population. For comparison, the observations were normalized by taking the logarithm.

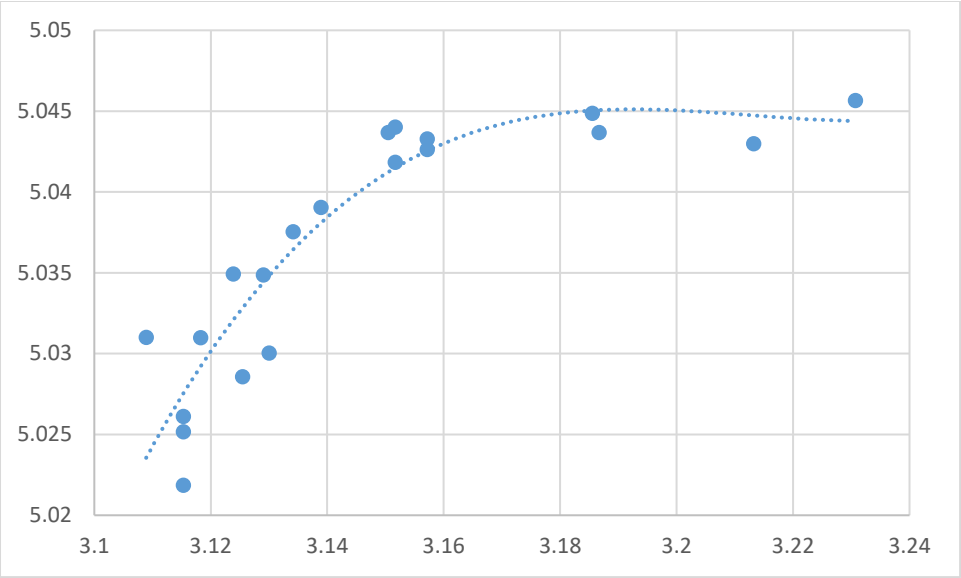


Figure 47: Normalized Supermarket Employment vs. Total Population

The supermarket employment is represented on the x-axis, and the total population is represented on the y-axis. We see a linear relationship between employment in the supermarket industry and the population, however, over time (remember both variables are increasing over time) the population growth is much slower than the growth of employment. This is evident by the upper limit around 5.045 (which was equivalent to 111 thousand) on the y-axis.

Over the sample period 2013 to 2017, we observe an average growth in the supermarket industry of 1.4 percent per quarter. In contrast, the growth rate of the population over the same period is equal to 0.3 percent per quarter. Thus, the supermarket industry is growing five times faster in terms of personnel than the population of Aruba. The table below (Table 16) provides an overview of the number of individuals employed within the supermarket industry and the total population of Aruba.

It has been noted that the number of supermarket permits granted has increased in the past couple of years. Such an increase may have influenced the number of employment within the industry, potentially distorting the industry growth rate.

However, when we look at the number of permits granted over the past five years from 2013 to 2017, we find a weak negative correlation of -0.14, between the number of permits granted and the number of employees registered at the SVB. Thus, the number of permits granted has no or very little effect on the number of people employed in this industry.

Table 16: Total Employment within the Supermarket Industry and Population Size.

quarter	dienstverbanden	total population
2013-Q1	1,304	105,157
2013-Q2	1,304	105,964
2013-Q3	1,304	106,195
2013-Q4	1,335	106,795
2014-Q1	1,349	107,159
2014-Q2	1,285	107,397
2014-Q3	1,313	107,394
2014-Q4	1,330	108,374
2015-Q1	1,346	108,355
2015-Q2	1,362	109,028
2015-Q3	1,377	109,407
2015-Q4	1,418	110,108
2016-Q1	1,414	110,578
2016-Q2	1,418	110,665
2016-Q3	1,436	110,309
2016-Q4	1,436	110,477
2017-Q1	1,537	110,576
2017-Q2	1,533	110,882
2017-Q3	1,634	110,400
2017-Q4	1,701	111,081

Source: Central Bureau of Statistics Aruba 2018; Sociale Verzekeringsbank 2018.

CONCLUSION PHASE I - IV

This research project consisted of four (4) carefully chosen methodologies, which consisted of a “Poll Analysis”, a “Spatial Analysis”, a “Sentiment Analysis” and a “Market Structure Analysis”. This provided a series of results for policy makers to use as arguments for the justification of the current moratorium on supermarket developments on Aruba and perhaps even as a tool to investigate the justification of moratorium on other sectors of the local economy. The following sections provide a conclusion for each of the findings.

Phase I

Conclusion Poll Analysis

As indicated in the result section, 15,266 people were reached, where 2,197 people engaged with the poll of which 63 participants left a comment and 52 shares were conducted. From the engaged participants, 1,800 respondents were obtained of which 94% chose to see less supermarket development on Aruba and 6% chose to see more supermarket development on Aruba. Obviously, the results indicates that the majority of the respondents do not wish for expansion of supermarket developments on Aruba. We do not recommend using this methodology and its corresponding results as the <u>only</u> argument for the justification of the current moratorium in place. However, poll results cannot be completely ignored, and especially if there is a negative sentiment towards the recent developments of supermarkets on the island.

Phase II

Conclusion Spatial Analysis.

A “Spatial Analysis” was conducted to explore the ratio between the amount of supermarkets with each Region/Region Size, Zone/Zone Size, and number of habitants per Region and per Zone. Specific Geographical Information System (GIS) data from Central Bureau of Statistics Aruba was used and its results were illustrated on Figures 2-11. As a subjective exercise, number two (2) was used as a threshold on Tables 1-9 to illustrate how many Zones are congested or not. Except for Region 5 (Santa Cruz) and Region 7 (San Nicolas-South), all other Regions and Zones appear to be overly congested, considering the amount of supermarkets per Zone and per Km2. Therefore it is recommended and highly suggested to create a geographical based moratorium framework, where expansions of additional supermarkets based on strict criteria that are not only economically sound, but socially and environmentally are permitted to areas that are have either zero (0) or less than two (2) supermarkets. Other logistical criteria such a size of operation (Small, Medium, and Large) needs to be re-defined and used as a tool to assist policy makers with their decision-making processes.

An additional exercise (Level of Saturation of supermarkets per Region) was also conducted where a subjective ratio of one (1) Km2 and one thousand (1000) habitants was proposed to measure the saturation level per Region. Here also, Regions Oranjestad-East, Oranjestad-West, Noord/Tanki Leendert appeared to be overly congested, while Regions Paradera, San Nicolas South, Savaneta and Santa Cruz are close to reach the saturation level.

To conclude this section, a geographical based moratorium framework is proposed instead of a "one size fits all" moratorium strategy for the whole island. There are limited spaces available for growth, however, critical criteria needs to be established before approving any additional permit for new supermarket establishments in these areas. The current moratorium is suggested to remain in effect for all remainder Zones that fall above the proposed threshold.

Phase III

Conclusion Sentiment Analysis.

Phase III consists of conducting a consumer "Sentiment Analysis" using a 6-point Likert Scale questionnaire. A total of 36 questions were used in the survey, of which 26 Likert Scale questions were categorized based on the following variables. They are: a) Perceived Social Cost; b) Environmental Sustainability; c) Long Term Planning; d) Perceived Economic Benefit; e) Neighborhood Centered Economy; f) Ensuring Client Satisfaction; g) Maximizing Neighborhood Participation; and h) Quality of Life. Each variable consisted of different specific Likert Scale questions that addressed each of the corresponding variable. Mean scores of each question were calculated and presented. However, the focus for this study was mainly on the level and agreement or disagreement for each of the questions belonging to the above-mentioned variables. This research did not perform any stochastic analysis with the obtained results, and the main purpose was to look at each of the questions individually.

Table 17: Critical Areas for the consideration or justification of the current Moratorium.

1=Totally Disagree, 2=Disagree, 3=Somewhat Disagree, 4=Somewhat Agree, 5=Agree, 6=Totally Agree		
Perceived Social Cost.		**Level Agree/Disagreement**
Q1	The amount of supermarkets in my neighborhood meet my needs and my living conditions.	35.3% Totally Agreed
Q2	Our neighborhood is overcrowded with supermarkets.	44.4 % Totally Agreed
Q3	The amount of supermarkets is growing at an acceptable level in my neighborhood.	32.2% Totally Disagreed
Q4	There is space for more development of supermarkets in my neighborhood.	74.5% Totally Disagreed
Q5	The supermarkets in my neighborhood do not generate jobs for our local community.	57% Totally Agreed
Environmental Sustainability.		
Q6	Adding more supermarkets does not improve our neighborhood's environment.	70.9% Totally Agreed
Q7	Supermarket development in our neighborhood takes the protection of the natural environment into account.	35.7% Totally Disagreed
Q8	The supermarkets in our neighborhood were developed in harmony with the natural environment	47.7% Totally Disagreed
Long Term Planning.		
Q9	The placement of supermarkets needs well-coordinated planning.	78% Totally Agreed
Perceived Economic Benefit.		
Q10	The current amount of supermarkets does not provide economic benefits to my neighborhood.	47.1% Totally Agreed
Q11	Supermarkets are beneficial for other businesses in the neighborhood.	29% Totally Disagreed
Neighborhood Centered Economy.		
Q12	Supermarkets hire most of their employees from within our neighborhood.	58.7% Totally Disagreed
Q13	Supermarket businesses in my neighborhood does not contribute socially to a neighborhood's improvement.	47.7% Totally Agreed
Ensuring Client Satisfaction.		
Q14	I am satisfied with the quality of the current supermarkets in my neighborhood.	24% Somewhat Agreed*
Q15	The supermarkets on the island provide quality client experience.	26.8% Somewhat Disagreed*
Q16	The supermarkets in my neighborhood are attractive to visit.	27.8% Somewhat Disagreed
Q17	In general, supermarkets are properly maintained on the outside (cleaned, painted etc.).	24.7% Somewhat Disagreed
Q18	In general, supermarkets are properly maintained on the inside. (cleaned, painted etc.)	26.7% Somewhat Disagreed*
Q19	The fact that I have easily access to a supermarket in my neighborhood is important for my living conditions.	28.3% Totally Agreed
Maximizing Neighborhood Participation.		
Q20	Citizens must be involved when planning for a new supermarket in their neighborhood.	58.8% Totally Agreed
Quality of Life.		
Q21	The amount of supermarkets create noise in my neighborhood.	22.3% Totally Disagreed
Q22	The current supermarkets creates traffic inconvenience (not enough parking spaces or traffic congestion) in my neighborhood.	18.9% Totally Agreed*
Q23	The amount of supermarkets create pollution (empty boxes, empty beer bottles, undesirable animals etc.) in my neighborhood.	21.4% Totally Agreed
Q24	The supermarkets in my neighborhood reduce the financial value on the properties around it.	24.6% Somewhat Disagreed
Q25	The amount of supermarkets create unsafe environment (illegal activities-theft, drugs, crime etc.) in my neighborhood.	21.5% Disagreed*
Q26	The amount of supermarkets create undesirable "smell" (old trash, smoke, etc.) in my neighborhood.	23.5% Somewhat Disagreed*

*results were spreaded or balanced

With the above-illustrated table (Table 17), we provide a summary of the results related to Questions 1-26. Those highlighted in red are believed critical for decision-making purposes and needs to be taken into consideration for the justification of the current moratorium in place. The results of the conducted sentiment analysis provide sufficient arguments to support the continuation of the current moratorium. The starred (*) results also provide similar results, but because of the obtained balanced results in opinion, we did not include them as critical.

Phase IV

Conclusion Market Structure Analysis (HHI, CPI and Growth Rate).

In this section, we first draw conclusions on the individual hypotheses followed by an overall conclusion on whether the market is considered "saturated". The HHI for the retail trade industry on Aruba is well below 1,500, and so, is considered competitive. Market concentration in the retail trade industry is not a point of concern and it appears that the marketplace is efficient in terms of competition. Thus, the first element of market saturation, which is competitiveness, is being met within the supermarket industry.

The local food index is increasing at a faster rate than the consumer price index,

suggesting market inefficiencies. This finding is anomalous in that it contradicts the findings above (competitive market structure). Furthermore, the local food index is increasing while the global food index and global crude index are decreasing.

Because most food products are imported to Aruba, one would expect the global food index to be correlated to the local food index. The same can be expected for the correlation between local food index and global crude index. This is true over a longer sample period. However, in the last five years, the local food index is weakly correlated to both the global food and crude indices. This finding indicates that the supermarket industry is underdeveloped, however, taking into consideration the local context of Aruba's food supply chain, prices are established by wholesalers which leaves little room for supermarkets to compete on prices.

The growth rate of the supermarket industry in terms of employment is five times greater than the growth of the population. As explained earlier, in a saturated market we expect the growth rate to be equal to that of the population. This finding clearly contradicts these expectations, and indicates that employability has increased in this industry sector. In other words, the demand within this industry is not satisfied by the available supply. However, there is an urgent need to investigate the type of employment present in the supermarket sector, especially related to the smaller supermarkets. The results of the survey and the overall perception of the citizens clearly indicates that the employability amongst supermarkets are not equally distributed amongst locals. In other words, there is a tendency that the type of employees hired by these supermarkets are solely based on their ethnic preferences.

CONCLUSION AND RECOMMENDATIONS

From the results, it appears that citizens do not wish for expansion of supermarkets developments on Aruba. The spatial aspect also highlights the besides Santa Cruz and San Nicolas-South, all other regions appear to be almost - or overly congested. However, the results also indicates according to the citizens that the supermarkets in the neighborhoods meet the needs and living conditions.

For the factors that influence the sustainable development of supermarkets on Aruba, citizens had a strong opinion about the spatial planning of supermarket placement and a strong desire to be involved in the process when planning for more supermarkets in their neighborhood.

Strong arguments related to the spatial developments, the overall sentiment of the citizens on the rapid developments of supermarkets, the environmental sustainability, and the employability suggests that the existing moratorium remains in place. On the other hand, based on the indicators used for the market growth analyses, only one indicator, which is the competitiveness of the industry, gives support of a saturation, although competitiveness is but one requirement necessary to consider an industry saturated.

Therefore, we conclude that:

An extension of the moratorium for two years is suggested, while a working group is appointed to take the above-mentioned results, and establish additional guidelines (definitions related to sizes of supermarkets, geographical-, spatial-, social-, -environmental and economic factors) for a sustained development of supermarkets within the retail industry of Aruba. This in turn will support the prevention, limitation and distortion of competition within this industry sector while promoting a free and undistorted market growth.

LIMITATIONS.

This study contains a number of limitations that deserve future discussions and investigation. First, from the limited desk research conducted, “Supermarket Saturation” has very limited documentation on specific methodologies, and especially for small island economies. The conceptualization of retail saturation has remained significantly dubious and perhaps even underdeveloped.

Very limited research were obtained on specific economic indicators that indicates if economic activity linked to the supermarket sector is saturated or not. More specifically, those related to market saturation on small island economies. Important to highlight is also the limited sources for clear definitions related to sizes of supermarkets such as mini-markets, small/medium/large supermarkets and hypermarkets which can be easily intertwined, suggesting clear definitions.

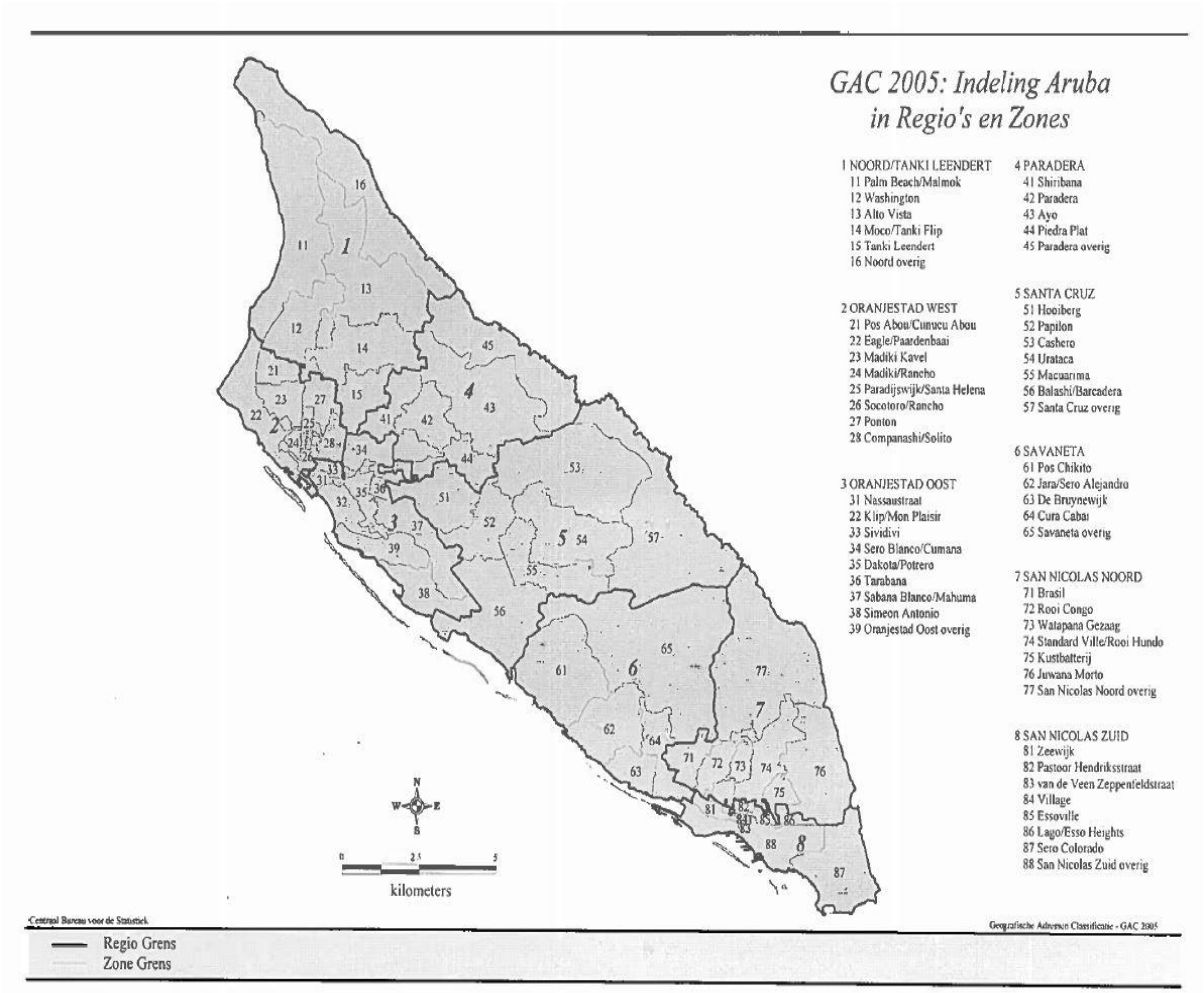
Retail saturation remains a concept which is generally loosely defined but the close definition consist of the concept which identifies its occurrence in situations where further retail expansion would prove unavailable, as a result of overcapacity on the supply side and effectively spreading available consumer demand too thinly. Obviously a supply and demand concern.

There were some gaps of the questions received by the respondents. Question 34 was the least answered question. Perhaps, respondents feel uncomfortable answering this question or feel it is inappropriate to ask this question. Other questions that were less likely to be answered include “Indicate where you live” and “Indicate other areas you go for grocery shopping”. A possible reason for the low responses may be that the response options are too detailed, making it difficult for respondents to answer. Consideration must be taken into account that the average individual is not familiar with the Zones in each of the Regions.

The process of obtaining secondary data, either in a timely matter or in the right format, and the hierarchal approval needed for sensitive data, jeopardized this research study in obtaining the desired results. For example, physical sizes of supermarkets are essential, but it was preferred to measure the size by the total tax return from the supermarkets by each Zone. Regretfully, this was not obtained.

Finally, it is important to highlight the limited sources for clear definitions related to sizes of supermarkets such as mini-markets, small/medium/large supermarkets and hypermarkets, which can be easily intertwined. We suggest clear definitions of these concepts. Further investigation is thus suggested to analyze the current business models of wholesalers (amount, size, expansion and if requirements are met on their registered business permit.

APPENDIX 1


GAC 2005: Indeling Aruba
in Regio's en Zones
1 NOORD/TANKI LEENDERT
11 Palm Beach/Malmok
12 Washington
13 Alto Vista
14 Moco/Tanki Flip
15 Tanki Leendert
16 Noord overig
2 ORANJESTAD WEST
21 Pos Abou/Cunucu Abou
22 Eagle/Paardenbaai
23 Madiki Kavel
24 Madiki/Rancho
25 Paradijswijk/Santa Helena
26 Socotoro/Rancho
27 Ponton
28 Companashi/Solito
3 ORANJESTAD OOST
31 Nassaustraat
22 Klip/Mon Plaisir
33 Sividivi
34 Sero Blanco/Cumana
35 Dakota/Potrero
36 Tarabana
37 Sabana Blanco/Mahuma
38 Simeon Antonio
39 Oranjestad Oost overig
4 PARADERA
41 Shiribana
42 Paradera
43 Ayo
44 Piedra Plat
45 Paradera overig
5 SANTA CRUZ
51 Hooiberg
52 Papilon
53 Cashero
54 Urataca
55 Macuarima
56 Balashi/Barcadera
57 Santa Cruz overig
6 SAVANETA
61 Pos Chikito
62 Jara/Sero Alejandro
63 De Bruynewijk
64 Cura Cabai
65 Savaneta overig
7 SAN NICOLAS NOORD
71 Brasil
72 Rooi Congo
73 Watapana Gezaag
74 Standard Ville/Rooi Hundo
75 Kustbatterij
76 Juwana Morto
77 San Nicolas Noord overig
8 SAN NICOLAS ZUID
81 Zeewijk
82 Pastoor Hendriksstraat
83 van de Veen Zeppenfeldstraat
84 Village
85 Essoville
86 Lago/Esso Heights
87 Sero Colorado
88 San Nicolas Zuid overig
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kilometers
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Geografische Adressen Classificatie - GAC 2005
Regio Grens
Zone Grens

APPENDIX 2

Market Structure Analysis (HHI, CPI and Growth Rate)

Statement of the problem

According to the National Strategic Plan of Aruba mission statement, the government seeks to govern using evidence-based policies. Government policy is an important tool for directing the development of a country, since policies can either promote or discourage development in many different aspects across a society. These aspects can be aggregated into three main aspects, which include; economic, social, and environmental.

However, some implemented policies with a significant impact, are created based on the sentiment or opinions of a few. An example of such a case is the current moratorium on supermarkets introduced during election year in 2017.

In response to this problem, our study proposes to investigate several options for objectively measuring various effects of the supermarket industry on our society. This study aims to provide policy makers with a tool to transform collected data into meaningful information on which to base future policy for the supermarket industry.

Theoretical framework

In this section, we discuss the concept of market saturation. Two elements of market saturation are discussed, namely competition and prices. In economics, market saturation is a situation in which a product has become diffused within a market. Every product or service has a natural consumption level that is determined after a number of years of sales and marketing investment (usually around 20–25 years). The actual level of saturation can depend on consumer purchasing power, as well as competition, prices, and technology. This study focuses on the two elements; (1) competition and (2) prices. In a saturated industry, we expect to see fierce competition amongst competitors and decreasing prices on products.

In addition, we look at the growth rate of the supermarket industry. In a saturated market, further growth of sales will occur only as a result of population growth. Thus, if the supermarket industry is saturated, we expect to observe an industry growth rate close to or equal to the population growth.

Competition

Competition within an industry cannot be measured directly as such. However, we can get an indication of the level of concentration within a market by employing the Herfindahl-Hirschman Index (HHI). The HHI is a common measure of market concentration that is used to determine market competitiveness, often pre and post mergers and acquisition transactions. Once we have a measure of market concentration, we can draw conclusions about the competitiveness of the supermarket industry.

The HHI was calculated by squaring the market share of each firm competing in a market and then summing the results. The index can range from close to zero to 10,000. The closer a market is to a monopoly, the higher the market's concentration and the lower its

competition. If, for example, there were only one firm in an industry, that firm would have 100% market share, and the HHI would equal 10,000, indicating a monopoly. If, there were thousands of firms competing, each would have nearly 0% market share, and the HHI would be close to zero, indicating nearly perfect competition.

Prices

Measuring the price of all the products sold by supermarket is tedious if not impossible. However, the Consumer Price Index (CPI) provides a good estimate of actual prices by measuring prices of a basket of goods that are representative of consumer buying behavior.

The CPI is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them. Changes in the CPI are used to assess price changes associated with the cost of living.

The same concept of the CPI can be applied to a specific category of products, such as food products. Thus, by monitoring the price of a select basket of food products, we get a good estimate of actual food prices. The reason we narrow down the CPI to only food products, is that these are the goods predominantly sold in the supermarket industry. Thus, analyzing price movement of these goods can help us gain a better understanding of the supermarket industry.

Growth

For the growth rate of the supermarket industry, we can measure it directly through administrative data collected by the SVB on employment. Data on employment can be disaggregated by industry, and so we can track the growth within a specific industry. For the growth of the population, we use estimates provided by the Central Bureau of Statistics. In both cases, data is collected on a quarterly basis from 2013 to 2017.
